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The use of portfolios to foster professionalism: attributes, outcomes, and recommendations

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ABSTRACT

The main objective of this research was to review the characteristics of portfolios and their outcomes for teaching professionalism to undergraduate medical students. A systematic review on the use of portfolios in teaching professionalism to medical students identified 1257 papers. Of these, 11 articles met all inclusion criteria. According to the papers, the use of portfolios for teaching professionalism shows versatility, supports learning strategies and has the potential to be used in different contexts, including for formative and summative purposes. The weaknesses were based on the artificiality of the reflections, deficient instructions, time-consuming processes and preference among students for other teaching methods. Students complained about feeling that the reflection was ‘forced’, and they tended to write based on social conventions rather than reveal their true thoughts. Reflection is a powerful component of the portfolio, but the method by which it is taught could easily ruin its potential to boost professionalism. Requiring reflection did not ensure its achievement; increased understanding by students regarding how and why they were doing it, the clarity of assessment methods and constructive feedback might strengthen the potential for success. A framework was designed to support faculty members in developing and applying portfolios with a clear and broad view of this teaching strategy.

KEYWORDS

Professionalism; portfolio;
medical education; reflection

Introduction

Professionalism is one of the core competencies in medical education (Hodges et al. 2011), accepted worldwide through consensus and guidelines (ABIM Foundation 2002; Carraccio and Englander 2004; Jarvis 2004; Swing 2007; Frank, Snell, and Sherbino 2014). This competency implies that doctors serve the patients’ interests above their own, exercising altruism, accountability, excellence, duty, service, honour, integrity and respect for others (ABIM Foundation 2002).

The teaching of medical professionalism involves all levels of medical training, including undergraduate, graduate and professional lifelong learning, and is linked to the development of the professional identity (Cruss et al. 2014). Among the main strategies in the teaching of professionalism, it is possible to highlight the importance of role models and reflection (Birden et al. 2013). However, key challenges that remain include: how do we best teach professionalism, and what are the better strategies to

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stimulate professionalism using role models and reflection in medical schools. The answers to these questions are important; professionalism can be taught improperly in medical education, and many students have been exposed to the lapses in professionalism of their peers, faculty and administrative staff (Hendelman and Byszewski 2014).

Portfolio usage has been highlighted as a promising means with which to foster professionalism, with its promotion of reflection (Rees 2005), self-directed learning (Prearo, Monti, and Barragan 2012) and ethics (O'Sullivan, Howe, et al. 2012). Portfolios are also frequently used as tools in competency-based education (Dannefer and Henson 2007; McCready 2007; Hall et al. 2012). Despite being a powerful tool, portfolios are vulnerable to several factors that can lead to failure in their implementation (Driessen, van Tartwijk, et al. 2005; Elango, Jutti, and Lee 2005).

A systematic literature review of the teaching and learning methods for professionalism (Birden et al. 2013) found that there was no consensus on the best teaching methods, but that studies included reflection as a key strategy. Thus, the teaching of both professionalism and portfolios has reflection as a pillar. Through reviewing original research papers focused on the use of portfolios in teaching professionalism in undergraduate medical education, we aimed to understand the main characteristics of these portfolios and evaluate their outcomes. Our second aim was to provide a source of data from which to make recommendations on portfolio design and suggest possible outcomes.

Methods

The basis used to design and report this systematic review was the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement (Liberati et al. 2009) and the Evidence for Policy and Practice Information Centre (EPPI-Centre) Methods for Conducting Systematic Reviews (EPPI-Centre 2007; Thomas and Harden 2008; Barnett-Page and Thomas 2009; Birden et al. 2013).

Conceptual definitions and eligibility criteria

Using as a reference the Population, Intervention, Comparison and Outcome standards, the main terms used in this review were defined as follows: P = undergraduate medical students; I = portfolio; C = with or without comparison with other teaching and learning strategies; and O = professionalism. This study did not aim to define the better learning strategies; thus, there was no restriction on the field 'C' (i.e. papers with or without comparison were selected).

We considered teaching and learning activities focused on professionalism as well as all educational strategies focused on the improvement of knowledge, skills or attitudes related to professionalism competencies (e.g. lectures, problem-based learning, journal clubs, simulation, clerkship rotations and others). These teaching methods must all use portfolios at some point in time. A portfolio was broadly defined as a collection of evidence with 'intellectual processing', in which students are required to demonstrate their standpoints or practise reflection (Buckley et al. 2009).

Search strategy

The term 'portfolio' was searched using 'portf*' (Driessen, van Tartwijk, et al. 2007). For 'professionalism', the search terms comprised words linked with this competency (Birden et al. 2014): 'professionalism', 'professional competency', 'humanities' and 'humanism'. The databases selected were EMBASE, MEDLINE, SCOPUS, Web of Science, LILACS and ERIC (Table 1). Within these databases, we included not only papers published within biomedical sciences, but also from the field of social sciences. The screening results were originally obtained in May 2014 and updated in November 2015.

Table 1. Database and search string.

<i>MEDLINE/PUBMED:</i> portf* AND (professionalism OR 'Professional Competence' OR humanism OR humanities)
<i>SCOPUS:</i> TITLE-ABS-KEY (portf*AND professionalism) OR TITLE-ABS KEY (portf* AND humanism) OR TITLE-ABS-KEY (portf* AND humanities) OR TITLE ABS-KEY (portf* AND 'professional competence')
<i>ERIC:</i> (portfolio OR portfólio OR portfolium OR portfolio) AND (professionalism OR 'professional competence' OR humanism OR humanities)
<i>WEB OF SCIENCE:</i> Topic: (portf* AND professionalism) OR Topic: (portf* AND professional competence) OR Topic: (portf* AND humanism) OR Topic: (portf* AND humanities)
<i>EMBASE:</i> 5 (#1 OR #2 OR #3 OR #4), 4# portf* AND humanities, #3 portf* AND humanism, #2 portf* AND 'professional competence', #1 portf* AND professionalism
<i>LILACS:</i> (tw:(portf* AND professionalism)) OR (tw:(portf* AND 'Professional Competence')) OR (tw:(portf* AND humanism)) OR (tw:(portf* AND humanities)) AND (instance:'regional') AND (db:('LILACS'))

Table 2. Selection – process.

Exclusion steps	Criteria	Examples for inclusion	Examples for exclusion	Research stages
1	Medical students – undergraduate	Undergraduate medical students of all academic years	Graduated professionals	Title/abstract/full paper
2	Competencies involving professionalism	The study has among its objectives the development of competencies on professionalism	Study focuses on competencies other than professionalism	Title/abstract/full paper
3	Teaching/assessment methods using portfolio	Describes the use of portfolios as a teaching/assessment method in any learning activity	Study describes only other methods, such as simulation, lectures, tests and others	Full paper
4	Original study	The study is original and conducted using scientific criteria and well-defined methods	Only descriptive papers, letter of opinions, and others	Full paper

Study selection and inclusion/exclusion criteria

To define the selection process, a subsample of the first 50 papers was selected and analysed in a meeting with all the reviewers (Table 2). Two reviewers proceeded with the selection process independently, and the inter-rater agreement was calculated using kappa (Sim and Wright 2005). In cases of disagreement, reviewers tried to find concordance at a consensus meeting. If disagreement persisted, a third reviewer made the final decision regarding exclusion.

Data collection and extraction process

A pilot guideline for data extraction was developed and applied to the included papers by two reviewers working independently (Table 3). The papers included two main categories of results: quantitative and qualitative. Quantitative results were extracted using descriptive data (frequencies, percentages, proportions), correlations and variance (Spearman, *t*-tests, Kruskal–Wallis, Pearson and others), and $p < 0.05$ was considered for significance.

Data synthesis for qualitative results

Most of the papers analysed used qualitative methods. Thus, we decided to synthesise the data through thematic synthesis (EPPI-Centre 2007; Thomas and Harden 2008; Barnett-Page and Thomas 2009; Birden et al. 2013). This method is recommended as a means to synthesise heterogeneous studies (Barnett-Page and Thomas 2009; Gough, Thomas, and Oliver 2012), and it helped us to organise and categorise all relevant information. Three reviewers performed it independently and found consensus in a meeting. This method involves three steps (Figure 1): (1) the identification of themes, through coding text,

Table 3. Data extraction guideline.

Reviewer:				
1. Author:	Year:	Title:	Journal:	Country(research):
2. Objective:				
3. Subjects (academic year, total number of subjects, response rate and the method for sample selection):				
4. Methods and study design:				
5. Results (describe the results, try to use text fragments, highlighted as fragment, statistics, others):				
6. About portfolio (portfolio characteristics and portfolio evaluations):				
7. About professionalism (portfolio outcomes):				
8. Your opinion about the results:				

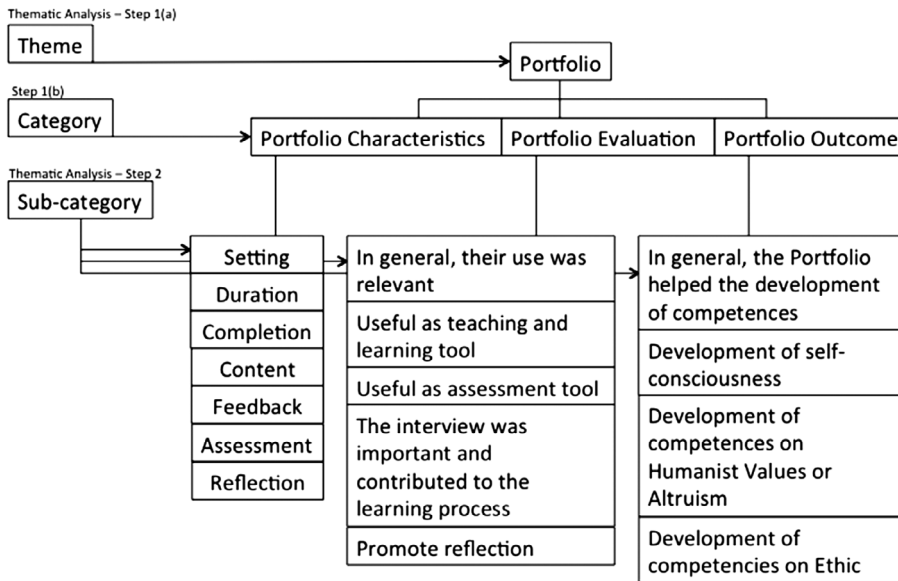


Figure 1. Thematic synthesis diagram.

identifying the ‘findings’ and coding line-by-line; (2) the description of themes; and (3) the generation of analytical themes (Gough, Oliver, and Thomas 2012).

Data synthesis for questionnaires

Almost all results from the papers regarding the uses of portfolios were based on data from Likert questionnaires and/or open-ended questions requiring qualitative analysis. The items from the Likert questionnaires and the fragments from open-ended questions were clustered into themes. The results of each paper in relation to each theme could be positive, negative or both. For each theme, we counted the number of items that showed significant differences (i.e. in the Likert questionnaires), and the fragments (open-ended questions) that were in favour of or against the use of portfolios in developing professionalism. When the majority of items or fragments was in favour, we considered the result as positive, and when the majority was against the theme, we considered this as negative. When the items or fragments included both supportive and negative aspects, we considered the result as both positive and negative.

Data synthesis of characteristics

The academic year (AY) was comprised of two grades: preclinical students (PC), who generally have the largest amount of work on theoretical disciplines and fewer activities with patients, and clinical students (C), who are generally in the last two years of their course of study and focus on learning in the workplace. The 'duration' was defined by the term AY and was considered '1 AY' if the portfolio had been used in one full discipline or for one year. The format was categorised into two main groups: electronic (web-based, e-mail, software or others) and paper based. The content was classified into two major classes: (1) the 'learning diaries' (LD), which report on the aspects or contents related to the learning process in patient consultations, allow room for reflection and provide space for notes on activities; and (2) the 'evidence of assessment' (EA), which includes all student assessments, mainly those related to the development of professionalism (including multiple-choice examination, other tests, objective structured clinical examinations, mini-clinical evaluation exercises and others). The feedback was related to an activity or to the portfolio itself. Tutors, faculty, peers and patients (either simulated or real) could provide feedback and/or assessment.

The components of the portfolio assessments were the purpose (formative and/or summative), the standardisation and the grading. The purpose was considered formative when the intent was to monitor student learning, and summative when the intent was to evaluate student learning. The standardisation referred to pre-established directives for assessment. Grading was related to graduate scores, measured quantitatively using scales from 0 to 10, qualitatively using the designations poor, regular and good or through the non-graded pass/fail method.

Quality of papers

The quality ratings were based on (1) the sample size, (2) the sample selection and response rates, (3) the methods of data analysis and (4) the quality of portfolio descriptors. Each paper was attributed a score that ranged from 0 to 15 (Table 4). The quality of each paper was classified as low (1–5), medium (6–10) or high (11–15), allowing for an understanding and analysis of the study's key concepts (Thomas and Harden 2008). The two independent reviewers reached consensus on all papers after two meetings.

Table 4. Standards defined for the quality-of-studies measurement.

Item	Standards	Score	Max. score
Sample size (a total of participants)	0–25	0	3
	26–50	1	
	51–100	2	
	More than 100	3	
Sample selection	Randomised sample or response rate of 75% or more	3	3
	Nonprobability sample (convenience, purposive, others) – well defined	2	
	Nonprobability sample (convenience, purposive, others) – poorly defined	1	
	Without description	0	
Data analysis	Quantitative	1	2
	Qualitative	1	
	Assessment of learning outcomes – self-assessment	0.5	2
	Assessment of learning outcomes – external assessment (tutors, teachers, peers)	1.5	
Portfolio – descriptors	6 or more descriptors	5	5
	3–5 descriptors	3	
	0–2 descriptors	0	
	Content, duration, reflection, purpose of assessment (formative/summative), feedback, learning outcome desired, portfolios assessment standardisation		

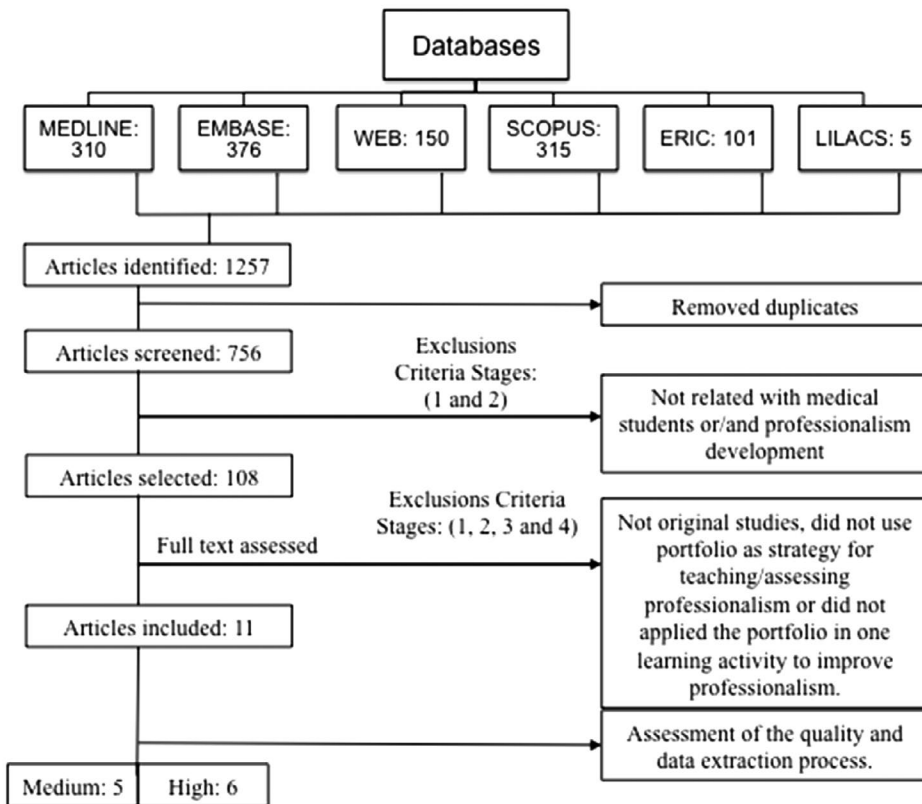


Figure 2. Research flow chart – study selection.

Results

Study selection

From a total of 1257 identified papers, after removing the duplicates, 756 papers were screened. Following the exclusion of papers based on titles/abstracts, the full texts of 108 papers were analysed, resulting in the inclusion of 11 papers in this review (Figure 2). Two reviewers carried out this process independently, and the kappa coefficient was substantial (0.76).

Quality of studies

Almost all studies included reached our quality standards (Table 5). The principal type of data analysis was qualitative. The qualitative papers followed appropriate guidelines to reduce elements of bias (e.g. checking and cross-checking (Goldie et al. 2007) and iterative consensus processing of themes (Kalet et al. 2007)).

Study characteristics

The main characteristics of the papers are described in Table 6. The publication years ranged from 2003 to 2013. Most originated from the United Kingdom (3/11) and the United States (4/11). The papers focused most frequently on programmes specifically designed for professionalism development, and general practice was the most commonly involved medical specialty. The response rate and total number of subjects varied among papers (5–100%; 8–526).

Table 5. Quality of studies.

Author	Sample size					Sample selection			Data analysis		Assess-external	Assess-self	Portfolio Descriptors ^c	Quality score	
	0–25	26–50	51–100	101–	Probab ^a	Intentional	Others ^b	Quantitative	Qualitative	Total					Quality
Borgstrom, Cohn, and Barclay (2010)				✓	✓				✓			✓	5	11.5	High
Dannefer and Prayson (2013)		✓			✓				✓			✓	7	12	High
Goldie et al. (2007)		✓				✓			✓			✓	6	11	High
Gordon (2003)			✓				✓			✓		✓	7	10.5	Medium
Haffling et al. (2010)		✓					✓		✓			✓	7	8.5	Medium
Howe, Barrett, and Leinster (2009)		✓				✓			✓			✓	6	10.5	Medium
Kalet et al. (2007)				✓			✓		✓			✓	7	11.5	High
MacLeod et al. (2003)			✓		✓				✓			✓	7	12.5	High
Murinson et al. (2011)			✓				✓		✓			✓	7	11.5	High
O'Sullivan, Howe, et al. (2012)			✓				✓		✓			✓	7	10.5	Medium
Wald et al. (2009)	✓						✓		✓			✓	6	7.5	Medium
Score	0	1	2	3	3	2	1	1	1	1	0.5	1.5	0–5	0–12	

^aProbab: randomised or with more than 75% of responders.

^bOther non-probabilistical sample selection.

^cRefer to characteristics of portfolios that were described in articles: content, duration, reflection, purpose of assessment, feedback, learning outcome desired, standardisation of the assessment. If it has: 0–3 features = 1 point, 4 and 5 features = 1 point, 6 or more: 5 points.



Table 6. Description of studies.

Description of studies						
Author	Year	Country	Studies – main theme	Context/setting	Subjects N (% participation)	
Borgstrom, Cohn, and Barclay (2010)	2010	UK	Professionalism values expressed in portfolios	General practice	123 (86%)	
Dannefer and Prayson (2013)	2013	USA	Professionalism self-regulation and learning needs in professionalism (congruence between students, peers and tutor evaluations)	PBL – sessions	32 (100%)	
Goldie et al. (2007)	2007	UK	Students' and tutors' perceptions of professionalism development using PBL in course to facilitate the development of professionally responsible attitudes and skills	Vocational studies course	10 (17%) tutors/24 (5%) students	
Gordon (2003)	2003	Australia	Students' evaluations of the impact of portfolios on personal and professional development	Programme for professional and personal development	195(67%)	
Haffling et al. (2010)	2010	Sweden	Students' reflections on development of professional competencies	General practice	35 (24%)	
Howe, Barrett, and Leinster (2009)	2009	UK	Examination of the discourses used by students in formal assessments of their ability to demonstrate professional values when reflecting on their experiences	Formal assessment of professional values that occurs yearly	50 (10%)	
Kalet et al. (2007)	2007	USA	Students' points of view on portfolios for professional and personal development	Programme for professional and personal development	164 (51%)	
MacLeod et al. (2003)	2003	New Zealand	Students' reflections on portfolios about a person who is dying and their family	General practice	51 (88%)	
Murinson et al. (2011)	2011	USA	The use of portfolios in a course focused on the development of emotional needs	Course about pain	118 (48%)	
O'Sullivan, Howe, et al. (2012)	2012	Australia	Students' points of view on the use of portfolios	Portfolios development	526 (45%)	
Wald et al. (2009)	2009	USA	Students' points of view on field notes and guided feedback in a course designed to teach clinical skills and professionalism	A course to promoting reflective practice	8 (11%)	

The use of portfolios and their characteristics

The characteristics of the portfolios are shown in Tables 7 and 8. The proportions will be described with the first number indicating how many times the characteristic was cited and the second number referring to a total of papers that described the characteristic. The total number of papers (including those that described and did not describe the characteristics) is always 11. The portfolios were applied to the preclinical and clinical years (4/11), the clinical years alone (4/11) and the preclinical years alone (3/11), showing that the difference among settings was minimal. Nine out of eleven portfolios were used for one AY or more, five presented in electronic form (5/5), and their completion was usually compulsory (9/10). The portfolios were comprised primarily of LD and EA, and the feedback was principally given by tutors (6/9). The purposes were for both summative and formative assessments (6/11), which were standardised (9/9) in a graded (4/8) or non-graded system (4/8). In programmes specially designed for professionalism, portfolios were used for more than one AY (5/5) and generally in both preclinical and clinical years (5/4).

The reflection was almost always a compulsory element of the portfolio (8/10), with tutors or faculty members suggesting content for the reflections (6/11), and some providing instructions for the reflection process (6/10). The reflections were shared only with tutors (9/11). The standards and guidelines for assessment of portfolios and reflections were present but differed between studies. These recommendations tended to focus on content that students should include, such as:

salient history and management, significance for the patient (and family members) of terminal illness, distinctive features of the community setting, distinctive features of palliative care, and a personal reflection. (MacLeod et al. 2003, 53)

Other recommendations focused on how to carry out the reflection process:

Excellent reflective work was characterised by multiple positive attributes including 1) thoughtful appraisal of self or relevant others, 2) correct use of appropriate terms, 3) evidence of proper assessment of the question posed, 4) absence of factual errors, and 5) length of writing adequate to address the points raised. (Murinson et al. 2011, 188)

Learning outcomes achieved

The outcomes were related to the use of portfolios (evaluation of the portfolios) and to the competencies developed or improved (outcomes achieved). The evaluation of portfolios showed that they were useful as tools for teaching and learning and that they promoted reflection. Furthermore, it was found that they supported the development of competencies, such as the development of humanistic values or altruism (Table 9).

Discussion

This discussion is organised in terms of the five topics highlighted in the study papers.

Portfolio uses

Portfolios were applied in both clinical and preclinical settings for a short or long period of time. Short durations were less common, and 82% were completed in one AY or more. One programme at the University of East Anglia in the United Kingdom required an annual summative assessment based on students' reflections on the portfolio process throughout the course (Howe, Barrett, and Leinster 2009). Programmes specifically designed for professionalism development tended to use the portfolio for longer periods.

The electronic portfolio was described in all papers that contained information about the format used. This format comprised electronic databases (with feedback and content posted by students, tutors and peers) (Dannefer and Prayson 2013) and web-based systems (Kalet et al. 2007). The electronic format seems to be more accepted by students and contains no loss in the quality of content and reflection (Driessen, Muijtjens, et al. 2007).



Table 7. Portfolio characteristics.

	Setting	Duration	Format	Completion	Portfolio content	Feedback	Assessment
Borgstrom, Cohn, and Barclay (2010)	C	AY	Ø	Compulsory	LD	Ø	Ø
Dannefer and Prayson (2013)	PC	AY	Electronic	Compulsory	LD/EA	Tutor/PEERS	STD
Goldie et al. (2007)	PC	>AY	Ø	Compulsory	LD/EA	Ø	Ø
Gordon (2003)	PC/C	>AY	Ø	Compulsory	LD/EA	Tutor	STD
Haffling et al. (2010)	C	AY	Electronic	Voluntary	LD/EA	Tutor/PEERS	NGRD
Howe, Barrett, and Leinster (2009)	PC/C	>AY	Ø	Compulsory	LD/EA	Tutor	GRD
Kalet et al. (2007)	PC/C	>AY	Electronic	Compulsory	LD/EA	Tutor/PEERS	GRD
MacLeod et al. (2003)	C	<AY	Ø	Compulsory	LD	Tutor	NGRD
Murinson et al. (2011)	C	<AY	Ø	Compulsory	LD	Tutor	GRD
O'Sullivan, Howe, et al. (2012)	PC/C	>AY	Electronic	Compulsory	LD/EA	Tutor	GRD
Wald et al. (2009)	PC	>AY	Electronic	Ø	LD	Tutor	Ø

Notes: C: clinical, PC: preclinical, AY: academic year, LD: learning diary, EA: evidence of assessment, Sum: summative, Form: formative, STD: standardised, NGRD: non-graded, GRD: graded, Ø: not measured, the paper did not provide information about this item.

Table 8. Reflection.

	Definition of the content to reflection			Method for reflection					Reflection		Sharing-reflection	
	Student	Advice	Staff/tutor	Freely	Guideline	Prescribed	Voluntary	Required	Tutor/advisor/teacher	Colleagues		
Borgstrom, Cohn, and Barclay (2010)	✓	✓		✓	✓		✓	✓	✓		✓	
Dannefer and Prayson (2013)		✓		∅	∅		✓	✓	✓		✓	
Goldie et al. (2007)					✓		✓	✓	✓		✓	
Gordon (2003)	✓			✓	✓			✓	✓		✓	
Haffling et al. (2010)		✓			✓			✓	✓		✓	
Howe, Barrett, and Leinster (2009)		✓			✓			✓	✓		✓	
Kalet et al. (2007)	✓			✓	✓			✓	✓		✓	
MacLeod et al. (2003)		✓						✓	✓		✓	
Murinson et al. (2011)			✓			✓		✓	✓		✓	
O'Sullivan, Howe, et al. (2012)	✓				✓			✓	✓		✓	
Wald et al. (2009)		✓			✓		∅	∅	∅		✓	

Notes: ∅: not measured, the paper did not provide information about this item, ✓: present.

**Table 9.** Outcomes and studies – aggregated by themes.

Outcomes-authors ^a	Self assessment					Self and external					External assessment		
	Quantitative		Quant/ qualitative Kalet ^b	Qualitative content		Dannefer	Goldie	Borgstrom	Howe	Macleod	Murrinson		
	Gordon	O'Sullivan		Haffling	Wald							Howe	Murrinson
1. Outcomes: themes related with the evaluation of the portfolio													
1.1. In general, portfolio use was relevant	✓	○	✓+X	✓	○	○	○	○	○	○	○	○	○
1.2. Promoted reflection	✓	✓	✓+X	✓	✓	✓	○	○	✓	✓	○	○	✓
1.3. Useful as teaching and learning tool	✓	✓	✓+X	✓	✓	✓+X	○	○	✓	○	○	○	✓
1.4. Useful as assessment tool	✓	○	✓	○	○	✓+X	○	○	✓	○	○	○	○
1.5. The interview contributed to the learning process	✓	○	✓	○	○	○	○	○	○	○	○	○	○
2. Outcomes – themes related to the outcomes achieved													
2.1. In general, the portfolio helped the development of competencies	✓	✓	X	✓	○	○	○	○	○	○	○	○	○
2.2. Development of competencies on humanist values or altruism	✓	✓	○	✓	○	○	○	✓	○	○	○	○	○
2.3. Development of competencies in ethics	✓	✓	○	○	○	○	○	✓	○	○	○	○	○
2.4. Development of self-awareness	✓	○	X	✓	○	○	○	○	○	○	○	○	○

Notes: ✓: the theme is present and paper results agree with the theme, X: the theme is present and paper results disagree with the theme, ○: not present – not assessed.

^aResearches were represented with the first name of authors to a better data organisation.

^bKalet used qualitative and quantitative analysis.

General practice (3/11) was the medical specialty within whose context the use of portfolios was most commonly proposed. This may be due to the general practice setting containing a broad array of learning possibilities (Alderson and Oswald 1999) that can occur opportunistically, as one day may be entirely different from the next. Thus, case logs, field notes and portfolios could help (Alderson and Oswald 1999) to integrate the varied experiences and information.

All papers included in their content the use of 'learning diaries', which involve learning activities, student notes or any other documents (written, drawn, filmed or other) that a student prepares according to the purpose of the activity. LD are composed of descriptions of a wide range of activities, learning goals for the next year or assessments of the students' own progress/development during the year (Kalet et al. 2007). They may also consist of reflective essays and reports of their learning experiences (Howe, Barrett, and Leinster 2009; O'Sullivan, Howe, et al. 2012). The 'evidence of assessment' is a document with scores, feedback, tests or any other commentary about the student's performance. Most of the papers (7/11) added this content to the 'learning diaries' to complete the portfolio, but there were no portfolios without LD. This showed us the importance of the LD in portfolio usage, and the EA in broadening the portfolio's scope.

The interview process (Gordon 2003; Borgstrom, Cohn, and Barclay 2010; Haffling et al. 2010) in the presentation of portfolios was highly rated by students, and enhanced the teaching and learning processes. Studies that included the interview process in their analyses recommended this strategy as a means to increase the tutors' appreciation of students' reflections and to generate personal feedback (Haffling et al. 2010). The interview process did not influence the students' opinions about the use of portfolios themselves. In two of the three that discussed the interview process, there are comments regarding problems in the application of portfolios. The interview clarified the students' views about portfolios. The interview, in association with the portfolio, not only contributes to teaching, but also helps to evaluate the strategy.

The teaching of professionalism should be incorporated into the entire medical school curriculum (Goldie 2008; O'Sullivan, van Mook, et al. 2012). Thus, professionalism needs to be supported and engaged strategically, with the potential to be used transversally and in different contexts. The use of portfolios seems to be a method that can serve these purposes. The conclusions of three out of seven studies indicated weaknesses in portfolio use that were based on the artificiality of student reflections (Kalet et al. 2007), deficient instructions, the amount of time consumed in their completion (Haffling et al. 2010) and the preference of students for other teaching methods (Goldie et al. 2007).

Reflection process

Reflection is a complex activity to be assessed and learned. However, it constitutes a core feature of portfolios. The students frequently have doubts, mainly about the construction of the portfolio, the clarity of instruction and the purpose (Goldie et al. 2007; Kalet et al. 2007; Haffling et al. 2010). As such, defining how reflection will be stimulated and assessed is essential to make the process clear and feasible.

Students' doubts could be reduced with more structure and guidance. This 'structuration' brings them more comfort but could overshadow the portfolio's encouragement of creativity and decrease its student-centred nature (Gordon 2003). If, on one side, we gain the clarity of defined criteria and methods, we create, on the other, a higher degree of student detachment, which distances them from their reflection objectives. More freedom in student learning could lead students to participate actively in the process (Elton 2010). Some students complained that they felt the reflection was 'forced' (Murinson et al. 2011). In other papers, authors noticed that the students were writing for social convenience rather than revealing their true thoughts (Kalet et al. 2007; Ross, Maclachlan, and Cleland 2009).

Despite these difficulties and pitfalls, reflection was almost unanimously evaluated in these papers as a skill that improves with the use of portfolios. The 'authenticity' criteria in the assessment should minimise these difficulties and provide feedback to students based on authenticity goals (Trevitt and Stocks 2012). Thus, it is essential that all aspects of the reflection process be carefully conceived, from the initial guidance and instructions to the assessment and feedback, with attention to the advantages

and drawbacks of each requirement in the process. The portfolio's reflection component should be guided without killing the spontaneity.

Portfolio assessment

The portfolio assessment was described as being conducted mostly for formative and summative purposes (6/11), as is the case in US medical schools accredited by the Liaison Committee on Medical Education (Chertoff et al. 2015). In this field, the portfolio allows continuous assessment and integrates the formative and summative purposes to perform as an excellent educational strategy in a wide range of assessment and learning environments (Dannefer and Henson 2007). Some studies concluded that the summative purpose was critical to the success of the portfolio, showing that only the formative approach did not achieve the optimum results (Sánchez Gómez et al. 2013). However, combining these purposes in an effective manner becomes a challenge (Bok et al. 2013).

The opinions of students and tutors about the feasibility and implementation of assessments are mixed. The portfolio should not be the students' only assessment (Goldie et al. 2007; Howe, Barrett, and Leinster 2009). However, when the portfolio was used, students felt integration and self-respect regarding the assessment process (McDonald 2012).

The portfolio could be a barrier to progress for students in some medical schools (O'Sullivan, Howe, et al. 2012), and the portfolio is often one of the most important components in student assessment. In their first year, students at the University of Sydney were assessed strictly with portfolios and interviews regarding their personal and professional development (Gordon 2003).

Possible outcomes

Considering just the outcomes assessed for more than 50% of papers (at least 6 out of 11), we noticed that authors generally concluded that competencies were developed or enhanced by the use of portfolios. The most commonly assessed outcome was reflection (9/10), and papers were in agreement about the promotion of reflection in using the portfolio. The reflection process was referred to as having an associative capacity that allows students to link their experience with professional development (Howe, Barrett, and Leinster 2009). The absence or insufficiency of personal reflection could even be a signal of problems in the outcomes of the learning activities (MacLeod et al. 2003), mainly, that activities focused on the development of competencies related to personal development as emotional responses, feelings and ethics. This importance grows as authors have found associations between lapses in professionalism in medical school and lower reflective capacity (Hoffman et al. 2016).

Altruism consists of putting the patient's needs above one's own (Cruess, Cruess, and Steinert 2001), and other humanist values include honesty, integrity, compassion, empathy, respect and trustworthiness (Swick 2000). The cognitive work promoted by the portfolio, particularly in activities involving the development of professionalism, can lead students into an introspective process. The studies revealed outcomes related to humanistic values and altruism (Table 10).

Table 10. Themes related to humanistic values and altruism.

Author	Themes
Borgstrom, Cohn, and Barclay (2010)	Students had differences among 'old and new' values in professionalism
Gordon (2003)	Students developed understanding of their own values
Haffling et al. (2010)	Students developed understanding of the patient as a whole person and the importance of sharing decisions
MacLeod et al. (2003)	Students were helped in comprehending patient needs and physician adaptability
O'Sullivan, Howe, et al. (2012) and Wald et al. (2009)	Students helped to understand social and cultural aspects of medical practice

The learning activities themselves were found to influence the development of competencies. Thus, the outcome needs to be considered in this light. Despite this, the portfolio was referenced as a strategy that aids in outcome achievement. Thus, at a minimum, using portfolios in teaching activities that foster professionalism creates opportunities and drives the improvement of knowledge and reflections in these fields. These opportunities are essential because the teaching of professionalism needs to move students toward the formation of a professional identity, and reflection and learning play important roles in this process (Cruess et al. 2014).

Framework: designing a portfolio to enhance the development of professionalism in medical students

According to the papers in this review, certain components are used frequently to build portfolios. Inspired by this, we organised a framework to guide the structuration of a portfolio (Figure 3). We analysed the data considering only the goal of fostering professionalism, but we believe that these suggestions could be applied to other learning environments.

The first step (deciding) is to define whether the portfolio is suitable to the teaching activity and learning objectives, and whether the strategy is needed and viable. The portfolio can be an assessment, teaching strategy, or even both (Buckley et al. 2009). The motivations of students and faculty must be pondered. A sense of ownership over and motivation to use the portfolio could be supported by an emphasis on learning and stakeholder involvement (Jenkins, Mash, and Derese 2013). It is important to identify and nurture the faculty’s willingness to apply the portfolio (Gordon 2003), and also provide the opportunity for training; mentors lacking in such instruction could also be involved in these learning activities (Kalet et al. 2007). The largest step in choosing a particular portfolio is making sure that the involved parties’ willingness and ability to use the portfolio are in alignment with the expected

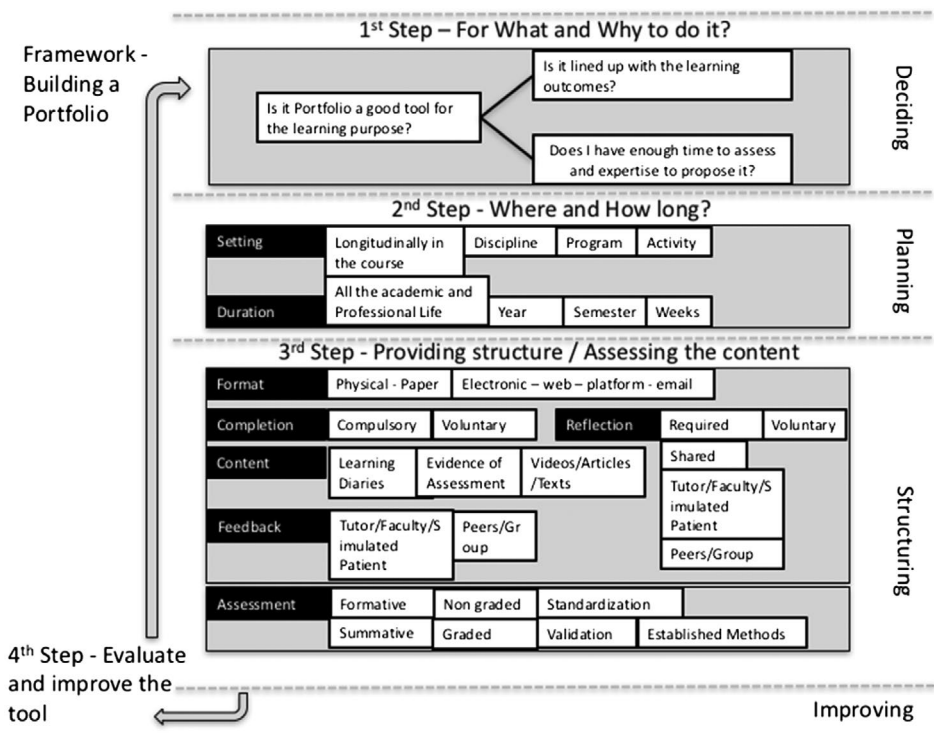


Figure 3. Framework – building a portfolio.

learning outcomes, student and teacher profiles and teaching environment (e.g. number of students, learning platforms, time).

The next step in the portfolio-structuring process (Step 2: planning) must ask the questions 'where?' and 'how long?'. These questions are related to two main elements: the setting and duration of portfolio usage. The shorter portfolios designed for one activity would be different from those involving more than one discipline, which would contain interdisciplinary assessment and activities that could be applied for years.

After deciding and planning, it is time to structure the portfolio (Step 3: structuring). This structure will provide the basis to achieve the outcomes expected and to assess the content (providing structure/assessing the content). It is important to keep the structure simple and in alignment with the objectives.

The sustainability of the portfolio must also be considered in structuring and improving the strategy (Step 4: evaluating and improving). User-friendly and feasible platforms, faculty and student understanding, student empowerment and feedback, and faculty development opportunities and recognition, have all been valuable tools in successful portfolios (Driessen, van Tartwijk, et al. 2007; Hall et al. 2012). The evaluation of a portfolio's use with consideration to students, faculty and all others involved is essential to adjust the strategy to prove and improve upon its efficiency.

Conclusion

The use of portfolios for the development of professionalism was generally well regarded and considered a sound strategy to promote the development of competencies in this field. The versatility, wide-ranging applicability and focus on reflection were the main potentials of a portfolio for professionalism. The reflection ability, which was mostly improved, should be a strong link between portfolio use and professionalism development. Reflection is a powerful element in the portfolio, but the teaching of it could easily ruin its potential to boost professionalism. Merely requiring reflection did not ensure its achievement; the understanding of students regarding the purpose and structure of the reflection process, the clarity of assessment methods, and tutor expectations and constructive feedback might strengthen the potential for the success of reflection. The framework for portfolio development to foster professionalism will support faculty members and students by providing a clear view of how the portfolio's dimensions and components contribute to its achievement and development.

The assessment methods and their validity and feasibility were not profoundly described in studies, but adding the interview to the assessment process served to enhance the beliefs of tutors and students regarding the assessment's validity and applicability. Despite suggestions for portfolio assessment methods (Driessen et al. 2005), there was no consensus among the papers. The use of standard methods and reliable assessments for portfolios, including careful consideration of specificities and particularities in each setting, could be the next step to improve the use of portfolios in fostering professionalism.

The bias and weakness of this review are based on the relatively small number of papers and the heterogeneity of the studies described therein. Thus, all of the statements and results must be considered with these limitations in mind. However, we designed a review focused on original papers and concrete learning experiences that contribute to our findings.

The portfolio is powerful, but any breakdown in the process of its construction or application could lead to failure. We hope that this review helps educators in the construction of robust portfolios allowing for the success and the use of this instrument to teach professionalism.

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