Medical Student Portfolios

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WHAT IS A MEDICAL STUDENT PORTFOLIO? Medical student portfolios
are used in a variety of ways to help institutions and students assess and track learner progress. In its original definition, a portfolio is a collection of drawings or papers that represent a compilation of a person's work. With the transition to competency-based assessments and the use of frameworks such as milestones and entrustable professional activities (EPAs), portfolios have become a valuable tool in many medical schools. Student portfolios can assist institutions to meaningfully display assessment evidence, enabling longitudinal tracking, and documentation of student achievement. With the appropriate supporting processes, portfolios can foster student skills in self-assessment and ongoing professional development. It is estimated that approximately half of U.S. medical schools use some type of portfolio system. Most portfolios are digital, involve mandatory participation, and include some form of reflective writing. The 2016 article by Chertoff et al. detailed curent uses of portfolios in undergraduate medical education in the United States.

HOW ARE PORTFOLIOS MOST COMMONLY USED? In general, there are
two broad uses for educational portfolios, specifically reflective portfolios and comprehensive portfolios (Roberts et al., 2014). The reflective portfolio is primarily aimed at developing reflective skills in learners. Reflective portfolios have been a self-contained part of the curriculum, meaning that reflection is an expected part of the curriculum the learner contributes to, or added as an assignment to an already existing course (Driessen, 2017).

Comprehensive portfolios are integrated into the curriculum as part of a program of assessment (van der Vleuten et al., 2012). The goals of this type of portfolio are to facilitate student's learning as and assess the student's progress (Driessen, 2017). Multiple sources of data, as well as reflections, are frequently included in the comprehensive portfolio.. This allows the student to monitor his or her ongoing progress and provides the school the ability to gauge whether s/he is achieving the established competencies.

Chertoff and colleagues conducted their survey to identify the numbers of schools using portfolios, the format of the portfolios, and the artifacts being collected in those portfolios. Some of the artifacts they found in portfolios included reflective writing, self-evaluation and self-assessment, student grades, and clinical performance evaluations. These findings are similar in nature to what graduate medical education portfolios collect (Donato & George, 2012).

Chertoff[1] also found that while almost 70% of the respondents using portfolios could assess student competencies, nearly 30% did not have the capability of assessing competencies utilizing their current portfolio systems. Less than 25% of all respondents indicated their portfolio system could provide visual benchmarks for a graphical overview of progress.

Critical in either purpose for portfolios, whether it be strictly reflective or a

comprehensive record, is faculty mentoring and guidance ([Driessen, 2017](#)). Portfolios, at the very least, can offer discussion points and assist students through reflection to make sense of what they are learning and experiencing. Comprehensive portfolios allow for greater potential for feedback on learner progress and evidence-driven, individualized plans for future learning. Without investment by the institution in faculty time to participate in a process of review and advice, the portfolio will not have as much impact on student progress as it could.

WHAT ROLE DO PORTFOLIOS PLAY IN MEDICAL EDUCATION?

Portfolios are used for multiple purposes, including student assessment, providing students with feedback, career planning, and as a repository of student work and achievement.

1. Portfolios housing assessments:
   a. allow a learner to collect and present evidence of strengths and mastery of competencies to augment the current modes of academic assessment
   b. track learner progress against defined learning objectives and performance expectations within the curriculum
   c. act as a broader method of assessment across the continuum of the medical student curriculum
   d. enhance the assessment of areas that are difficult to assess by traditional methods, such as attitudes, personal attributes, reflection, critical thinking, and professionalism
   e. encourage more effective learning via ongoing reflection and learning plans
   f. blend formative and summative feedback
   g. provide evidence of completion of curricular requirements
   h. provide an integrated and longitudinal strcutre across the entire curriculum
2. Portfolios support feedback:
   a. allowing a mentor to provide input on artifacts students enter into the portfolio
   b. allowing a mentor to provide feedback on the learner's skills based on materials presented/represented in the portfolio
   c. for both formative and summative assessment purposes
   d. by serving as a platform for formal feedback and a mechanism for mentors to provide direct written feedback to the learner
   e. that ideally would include input from peers
   f. used to determine the learner's readiness to progress to the next level of training
   g. that can be used to identify gaps in an individual's learning
3. Portfolios contribute to Career Planning by:
   a. supporting the transition from undergraduate to graduate medical education and beyond
   b. linking to existing medical school tools and services around career planning
   c. demonstrating career progression if maintained as an ongoing resource

        d. facilitating the maintenance of an up-to-date curriculum vitae

        e. assisting with active ongoing maintenance of competency going forward as a physician

4. Portfolios as a Repository:

        a. can support a process that engages a learner in self-reflective, individualized development as a professional

        b. can generate tangible evidence of what was done and the level of achievement relevant to established benchmarks

        c. ideally can be taken with the learner to the next level of career progression

        d. can provide a database of procedure/clinical experiences/encounters

WHAT ARE THE CHALLENGES TO USING PORTFOLIOS?

When considering the challenges with using portfolios to deepen medical student learning, a systems-approach focusing on people, processes and technology is useful. Often, technology solutions are used to "fix" perceived problems without first identifying and addressing people and process challenges. Careful consideration of each of these aspects will go a long way towards developing a successful medical student portfolio program. Clarity of purpose related to the portfolio and surrounding process (simple documentation of activities, formative growth, summative assessment, or a combination thereof) is essential during the design and implementation process and will provide the basis for addressing challenges.

People: Challenges can arise when developing a medical student portfolio program from four main people groups; medical school administrators, frontline clinical supervisors (residents and faculty), portfolio coaches, and the medical students themselves. Each of these groups must be considered to facilitate successful implementation. Commitment or "buy-in" for developing a portfolio program can represent a significant challenge for each of these groups. The barriers to buy-in are different for each group, however.

Medical school administration is often concerned with the cost of the investment, in terms of both time and money related to the various groups involved (faculty, administration, technology team, and students). Additionally, the administration should establish a process to routinely analyze the performance of the assessment tools that populate the portfolio. If students and faculty lack confidence in the quality of the evidence, the portfolio will not be effective in guiding future learning (Lomis et al., 2017).

Frontline clinical supervisors are most concerned about the burden of documenting asessments and the impact of the portfolio process on busy clinical environments. Students highly value the opinions of supervisors; their beliefs are constantly being shaped by the clinicians they work with daily. If the frontline clinical supervisors do not value the portfolio process or, even worse, if they speak negatively about it, medical student engagement will markedly decrease.

Portfolio coaches are often concerned with their own skills and ability to interpret data and have the (at times difficult) conversations needed to help guide students in the

process. Characteristics of individual medical students, such as mindset (fixed vs. growth), motivation (internal vs. external) curiosity, and resilience can facilitate or impede the relationship with the coach and the process of learning from their own portfolio.

Students also require the skills of informed self-assessment, receptivity to feedback, and ability to set goals and implement change based on areas for improvement identified in the portfolio process (Cutrer et al., 2017).

Process: In addition to the specific challenges for each of the individual groups involved, the process itself can pose several challenges. Factors such as how portfolio data are accessed, how often the reviews occur, how the coaching session is formatted, and whether the coaching is focused only on certain time points or longitudinal throughout the students' medical school journey. Students new to the portfolio process will likely feel that it is disconnected from their normal workflow. Establishing a process that embeds accessing the portfolio within the normal flow of clinical rotations (ie where students can find clinical assessments) can help student become more familiar with where data is located and how to most effectively access it. Until the portfolio begins to feel like a natural part of the learning journey for trainees, a more structured and regimented process will be needed to deepen their engagement with the portfolio. A well designed process can allow students to rapidly gain familiarity with the portfolio and gain confidence in their own abilities to find and review performance data.

Technology: Only after the challenges in the areas of people and process are identified can we begin to effectively address the wide-ranging technology issues inherent in electronic portfolio systems. While much was written early on about the benefits and drawbacks of paper vs. electronic portfolios, the field is now moving rapidly towards the use of electronic portfolios. With this move come other challenges including which electronic platform to use and whether to develop a "home-grown" portfolio that fits the specific needs of the program or to purchase a portfolio system from a vendor and adapt it (and if so, which vendor and which product). Challenges also include factors specific to the portfolio program, such as how easy it is to enter data, how easy it is to access the student's data, how the data is displayed, how the technology facilitates or impedes the process as envisioned. From the perspective of the medical school administration, consideration must also be given to portfolio capabilities such as data aggregation and visualization at not only the individual student, class and program levels.

WHAT RESOURCES ARE REQUIRED? Before embarking on a medical student portfolio project, institutions will want to consider what resources are necessary to successfully implement a portfolio system. Resources include stakeholder buy-in from faculty, students, and school administrators, consideration of student and faculty time, the staff support needed to maintain and monitor portfolios, the purchase or development of hardware and software to handle an electronic portfolio system, and the faculty development required to ensure consistent rater reliability.

Stakeholder Buy-In: Several authors suggest that obtaining faculty, student, and

administrator buy-in is critical to the success of a portfolio system and lack of buy-in from any one of these groups could lead to failure (Donato & George, 2012). All key stakeholders must understand the benefits a portfolio system offers, as well as the return on their investment of time, energy, and resources.

- Faculty – without faculty buy-in, it will be 1) difficult to secure a sufficient number of faculty champions to serve as mentors and 2) unlikely students will fully engage and participate in maintaining a portfolio. Several authors have gone so far as to suggest that if faculty support is weak, the school should reconsider implementation until sufficient support is obtained (Donato & George, 2012; Driessen, 2017). A few reasons for why faculty support may be difficult to obtain is described in more detail below.
- Students – soliciting student input into the development of a portfolio system will improve buy-in as well as provide the developers with valuable feedback on what works well and what needs improvement. When students are involved in the development process from the beginning they are more likely to feel a sense of "ownership" in the project, which can create positive student experiences and attitudes (van Tartwijk & Driessen, 2009).
- Administrators – the literature is silent on how to secure administrator buy-in, however, it is often the school administrators, such as the dean and financial officer that must be convinced more than any other key stakeholder of the benefits and return on investment of implementing a portfolio system. While the financial costs associated with developing, implementing, and sustaining portfolio systems will vary from one institution to another, the costs are not inconsequential. Schools may want to consider using the Business Model Canvas for Medical Educators tool to help identify stakeholders, necessary resources, cost structure, and the potential return on investment associated with implementing a portfolio system.

Faculty Time: Mentors and coaches are instrumental to the success of student portfolios, but serving in this role requires a significant investment of time to attend faculty development sessions and evaluate student portfolios (van Tartwijk & Driessen, 2009). Most faculty mentors or coaches are also clinicians who must take time out of their clinical practice to attend workshops, which potentially results in a loss of clinical revenue for the faculty member and his or her department. Administrators need to be sensitive to this important issue when considering the development of training programs and the possible need for salary support.

Student Time: It is also important for learners to believe that participating in a portfolio system is intrinsically valuable to them personally. Without this belief, students are likely to complain that keeping a portfolio is a waste of time and they are simply "jumping through hoops (Cutrer et al., 2017). Scrutinizing one's own performance in the presences of a faculty mentor is not particularly comfortable nor intuitive. It is essential to create a safe environment for students and to emphasize the connection of this guided portfolio process to habits that will promote their success throughout their career. Helping the busy clinical student recognize that their perceived lack of time for this

exercise is never going away can help them understand the challenges of maintaining one's professional development once in practice.

Staff Support:
- IT staff support
- OME staff support
- In addition to time burdens, staff members often incur the brunt of any frustrations of students or faculty members with a new process or technology platform. Making staff aware of the rationale is important. Additionally, staff members supporting this process may recognize that they themselves would benefit from more attention to their own professional development, so forums for discussion and resources should be made available to the team.

Portfolio Platform:
- IT platform, development, hardware, software
- Homegrown vs open source vs commercial
- Support and scalability
- Security and privacy
- Ownership and intellectual property
- Long-term maintenance (Lorenzo G & Littelson J, edited by Oblinger D. An overview of e-portfolios. Education Learning Initiative, July 2005)

Faculty Development: Faculty guiding the portfolio process must receive training on how to use the portfolio platform and must become proficient in navigating it. Consistency among faculty in the appraisal of documented performance and of the quality of student reflections, as wella s the types of actions recommended, is valued by students. Faculty will also need training on how to earn student trust, provide high quality written and verbal feedback to students, and conduct sometimes challenging conversations. Learning how to offer advice to high acheivers is important, so those students can benefit from this process and optimize their growth as well.

WHAT IS THE ROLE OF THE COACH? A static portfolio is simply a repository,
a history of the student's experiences and performance. The portfolio serves a more powerful purpose when incorporated into a dynamic, structured process of regular review and action. To rise above "busy work" in the minds of students, contributions to the portfolio should have meaningful consequences that guide future learning. Many institutions have thus created a coaching or advising structure to complement the portfolio.

Dannefer et al describe the importance of advisers in fostering students' skills in reflective practice. Recognizing that self-assessment is inherently flawed (Eva & Regehr 2005), advisers are recruited to help students interpret the evidence in their portfolio and to monitor their progress (Dannefer & Henson, 2007). Mann et al emphasize the value of *informed* self-assessment: "processes through which individuals use external and internal data to generate an appraisal of their own ability...The process is aided when engaged

facilitation guides learners in interpreting and using data appropriately".

Formative feedback and opportunity for improvement are essential elements of competency-based assessment frameworks (Cutrer et al., 2017, van Tartwijk & Driessen, 2009). Portfolios are a powerful tool to promote assessment *for* learning. When a worrisome performance trend is identified, targeted remediation specific to the performance concern can assist the learner in attaining the desired outcome.

Lomis et al describe the role of coaches in mitigating against the potential errors of an assessment system. Embracing the complexity of authentic workplace-based assessments requires valuing differing supervisors' perspectives on performance. *"The structured, faculty-facilitated self-assessment cycles promote thoughtful interpretation of the milestone results for each learner; the learner and coach weigh the value of each data point. This helps to control for error in the system, and optimizes the application of this evidence into an actionable learning plan."*

HOW DOES COACHING ENHANCE THE VALUE OF PORTFOLIOS?

The term "coach" is used differently across institutions and should be clearly defined. In some systems, interactions with coaches are purely formative; in others, coaches contribute to summative assessments and decision-making about student advancement. Although all faculty members are expected to support student development, students should be informed which faculty advisors are considered a "safe harbor" and which have a more active role in high-stakes decisions.

Coaches can serve as interpreters, helping the student review and understand performance feedback. The novice student may struggle to accept critical feedback and/or to fully comprehend its relevance to future duties. Coaches can provide examples and insights that serve to validate and prioritize feedback.

Coaches help students translate feedback into an action plan, and guide learners in establishing SMART goals (specific, measurable, achievable, relevant, time-bound) (Tofade, Khandoobhai & Leadon, 2012). Coaches can recommend relevant resources in the learning system to help the learner attain the established goals. In some cases, the coach may directly provide this assistance, or may refer the student to a domain expert.

WHAT IS THE COACHING PROCESS?

A structured process supporting routine review of performance is important to foster skills in informed self-assessment. A systematic devotion of time, and a clear impact on the student's educational experience, are important to establish buy-in and generate results. The hope is that students will internalize these practices and such scaffolding can be gradually withdrawn over time (Sargeant et al., 2011).

In most portfolio systems, the learner and coach independently review data, then meet to compare notes and reconcile any differences in interpretation. This is an important step in fostering self-assessment skills; over time, one expects greater alignment in the

interpretation of the portfolio evidence. Having established how well current performance meets expectations, attention can be turned to next steps. For a learner who is on target, the individualized learning plan can be driven by personalized interests. When a performance concern is identified, thoughtful scrutiny with the coach enables a more targeted approach to improvement.

Goal setting reinforces priorities for development and provides a structure to monitor for development. Coaches provide students encouragement and accountability to follow-through on learning goals. This may require not only opportunities for remediation of deficits but also opportunities for the advancement of high performers.

In systems in which the portfolio process informs summative decision-making, the coach and/or student submit regular progress reports on the learner's development. To validate the time and effort invested by both parties, the process should have meaningful consequences on the learner's experience.

The goal is to assist each learner in attaining the desired learning outcomes. Reports from several institutions, such as Northwestern and Vanderbilt, indicate that a programmatic approach to assessment combined with a structured portfolio process can help identify performance concerns earlier, and that most of these concerns are amenable to targeted remediation plans. Ideally, akin to athletic coaching, this process can also propel our strongest performers in their ongoing pursuit of excellence.

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