

# Use of Portfolios for Assessment of Resident Teaching Skills

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## Abstract

**Background** Portfolios are effective instruments for assessment of teaching skills among professional teachers and have recently been adapted in medical education. However, scoring rubrics are needed to effectively guide assessors.

**Intervention** Portfolio assessors reviewed and made assessment comments about the resident-as-teacher sections of 11 internal medicine residents' electronic portfolios and discussed their assessments in an assessor group discussion. We performed qualitative analyses of written and oral comments. Major themes were identified, and member checking and triangulation with the literature was performed to evaluate the trustworthiness of the qualitative analysis.

**Results** Three faculty educators reviewed and commented on 241 uploaded e-portfolio documents accompanying reflections. Three major themes were identified: Application of Teaching Skills, Presentation Skills, and Insights as a Teacher. Themes and subthemes matched closely to several components of the conceptual framework of effective presentations formulated in Glassick standards for scholarly work, as well as themes found in assessments of professional teachers' portfolios.

**Conclusions** Assessments of portfolios by experienced faculty educators appear to be useful for identifying many important facets of formal teaching presentations and may be useful for creation of a scoring rubric.

## Introduction

Residents spend 20% of their daily activity in teaching efforts, primarily instructing other residents and medical students on the practical delivery of medical care.<sup>1</sup> Fifty-five percent of internal medicine programs have created formal resident-as-teacher curricula to enhance their residents' teaching skills.<sup>2</sup> However, assessment of this teaching with commonly used assessment tools has significant limitations. Two common instruments, surveys of learners and direct observations of teaching, are limited by their context specificity and potential for grade inflation and halo effects.<sup>3</sup> Objective measures of teaching skills are another tool that can serve to standardize the teaching environment<sup>1</sup>; however, time and resource constraints limit the ability to perform repeated assessments needed to track growth over time. Professional teachers and their assessors have long recognized these limitations and have moved to

the use of portfolios for longitudinal assessment of teaching effectiveness.<sup>4</sup>

However, assessment of portfolio content presents its own set of challenges. Reliability is too low for high-stakes decisions ( $r = 0.1-0.6$ ).<sup>5-7</sup> Think-aloud studies suggest that portfolio assessors apply none of the heuristics they use in vetting data from their field of study and demonstrate no specific, identifiable criteria for their analysis of portfolios.<sup>8,9</sup> To create a fair and transparent process for portfolio assessment, it is recommended that assessors specify clear and transparent goals and develop scoring rubrics for assessment.<sup>8</sup> For those rubrics to be authentic and valid for users, they should be derived from either existing learning theories or from reviews of existing portfolio assessments.

The question that guided our study was "What evidence of scholarly teaching and longitudinal growth could be identified from reviewing resident portfolios?" Our intent was to identify themes that might serve as the basis of a scoring rubric.

## Intervention

### Context

The Reading Hospital and Medical Center piloted a portfolio assessment tool 5 years before this study for its 26 internal medicine resident trainees and moved all portfolio content to an online format 2 and a half years ago. The stated goals of the portfolio are mentor-guided develop-

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ment of personal learning goals. Contents of the portfolio include all of the residents' assessment documents, including sections on scholarly activity (formal presentations, research, abstracts, and publications). Residents are instructed to choose 1 representative document (eg, PowerPoint slides or a handout) from any scholarly activity and reflect on their performance, with or without the help of prompted questions. They have the option to password protect any content from mentor review. Residents meet with faculty advisors to review the contents of their portfolio 3 times per year to develop performance improvement plans. Residents have an annual summative review of the portfolio by a (nonmentor) program director who generates an unstructured letter describing the positive qualities of the learner's work as well as a global score for reflective ability.

### “Resident as Teacher” Curriculum

Residents receive 6 hours of workshop training on teaching during residency training. Topics include small-group teaching, large-group teaching, techniques for feedback, fostering learning climate, and application of learning theory to practice. Residents typically teach 5 to 15 conferences per year, including morning report, noon conference seminar, morbidity and mortality conference, and journal club. Residents receive immediate oral feedback as well as electronic feedback following each teaching session.

The Reading Hospital Academic Affairs Office approved this project as Quality Improvement, which was confirmed by the Reading Hospital Institutional Review Board. Eleven of the 12 residents' (92%) portfolios were selected because they had graduated, and because during the initiation of the electronic portfolio they had given consent for re-review of their scholarly activity, with 1 resident (8%) not able to be reached. Analyzed portfolio documents include those from the 11 learner portfolios only.

### Portfolio Review

Three purposefully selected faculty members were instructed to review portfolio sections pertaining to scholarly activity for the 11 learner portfolios, searching for evidence of effective teaching and longitudinal growth in teaching skills. This faculty then participated in a group discussion of their findings. A qualitative analysis was performed of the 3 faculty members' independent written assessments of residents' structured portfolios as well as their oral comments made during a group discussion of their findings. Qualitative analysis was performed by the primary investigator (A.A.D.), who was not a portfolio assessor in the study.

The portfolio assessors were selected for their prior experience with mentoring using portfolios. They are experts in internal medicine, with 10, 21, and 28 years' experience in residency education. All 3 had participated as

#### What was known

Residents spend significant time teaching junior residents and medical students, yet traditional assessment methods are not suited to evaluate teaching skills.

#### What is new

Portfolios are an effective approach for assessing teaching skills, when assessors are provided scoring rubrics to enhance the reproducibility of assessments.

#### Limitations

Findings may have been influenced by the structure of the portfolio, residents' selectivity in including work, and assessors' prior knowledge of residents, limiting robustness and generalizability.

#### Bottom line

Assessments of resident teaching portfolios by faculty were able to identify aspects important to formal teaching and may be useful in creating scoring rubrics for this type of assessments.

mentors for reviewing resident portfolios for 2 to 5 years, and 2 of the 3 (67%) had given seminars on teaching skills for faculty development and residents. One (33%) had been a summative portfolio reviewer for 3 years. One (33%) had completed a certificate program in medical education.

The 3 faculty assessors reviewed all available documents in the portfolio pertaining to scholarly activity during the 3 years of a resident's time in residency and were asked to independently write comments based on the uploaded documents, the residents' reflections, or the improvements seen when comparing multiple documents uploaded at different times. The faculty were asked to make comments in response to the following 2 questions, in light of reviewing the portfolios: “What evidence do you find of effective teaching?” and “What evidence do you find of responses to feedback about teaching?” Each faculty member independently reviewed 8 of 11 portfolios (73%), so that each portfolio was reviewed by 2 participants. Each faculty member recorded all evidence they obtained about both questions on each portfolio in a Microsoft (Redmond, WA) Word document. The 3 participants were then brought together for a group discussion to discuss their perspectives, during which they responded to focused questions about their written assessments. The group discussion was transcribed.

### Data Analysis

The constant comparative method of analysis associated with the grounded theory approach<sup>10</sup> was used to analyze the individual faculty assessors' portfolio-assessment comments. The unit of analysis was the phrase or sentence reviewed to identify concepts or constructs. All concepts were grouped into distinct themes. The themes were identified by the primary author (A.A.D.) and were labeled

with codes for facilitation of analysis. A transcription of the group discussion was similarly reviewed to identify illustrative quotes for each theme to provide a thick description. Quotes were corrected for grammar and changed (indicated by brackets) to improve readability and to make the author and/or resident anonymous. All 3 faculty members reviewed the themes, along with their own and the other faculty members' comments, and the transcript of the group discussion to confirm the analysis as a member check.

## Results

There were an average of 21.9 uploaded documents and associated reflections per resident for portfolio assessors to review (range, 7–44; median, 16). All 3 faculty participants were familiar with the work of the residents whose portfolios they reviewed. From analyzing the faculty members' individual assessment comments about these portfolios, 3 main themes were identified: (1) Application of Teaching Skills, (2) Presentation Skills, and (3) Insights as a Teacher.

### Application of Teaching Skills

The theme with the greatest number of comments was Application of Teaching Skills, which included 88 comments. Identification of a specific teaching technique in either the uploaded documents or the accompanying reflection was noted 35 times. Examples of specific techniques identified included use of breakout sessions, linking clinical findings to pathophysiology, and use of standardized test questions. An illustrative quotation is

I thought he did better over time with grounding things in his vignettes and telling the doctor's stories. In the beginning, he sort of just jumped into a topic. But he notes the merits of moving to a case-based format, which worked much better for him (theme, Application of Teaching Skills; subtheme, Specific Teaching Techniques).

The development of objectives as the framework for presentations was described 18 times. An illustrative quotation from the group discussion is

It seems that probably most of us are giving them feedback in their first year to choose 3 to 5 major learning points and to try to focus your discussion around those. Some accomplished that better than others, but I think most of them have heard that (theme, Application of Teaching Skills; subtheme, Development of Objectives).

Other frequently described examples of teaching techniques are the framing of discussions with introductions and conclusions (described 16 times). One faculty member commented in the group discussion

I think then that you see the addition of things over time, like agenda setting slides, summation slides at the end. It is harder for the [residents] who are less 'buying in' to the system, to really be able to tell much, but the people who put all their presentations in, the good and the bad, I think this was a good way of seeing growth. In some of them, it was great watching them go from first year to second and third and say, 'Wow they've really got it now!' (theme, Application of Teaching Skills; subtheme, Framed Topic [Introduction/Conclusions]).

The subtheme of Appropriateness for Audience included 15 comments. As 1 faculty member commented in the group discussion

Ah, in terms of documenting growth, I think one of the nice things I saw with him is a realization that, while it might be exotic, it may not be useful. Toward the end of his third year, he started to focus on topics that might be useful and more practical to the audience (theme, Application of Teaching Skills; subtheme, Appropriateness for Audience).

The subtheme of Subject Mastery demonstrated in teaching included 4 comments. One illustrative quote from the group discussion was

There were a large number of entries from him which made it easy to collect information. In summary, I think there were several that consistently showed that his knowledge of the subject and his level of sophistication were quite good (theme, Application of Teaching Skills; subtheme, Subject Mastery).

### Presentation Skills

A distinct theme identified focused on Presenting Skills, and 74 comments were identified. Organization of Slides and Presentation (22 comments), General Speaking Skills (20 comments), and Involving the Audience (16 comments) were frequently identified in faculty assessments of the portfolios. Illustrative quotes are

I think in the [portfolios] that put a nice assortment of presentations in from intern year through third year, you could definitely see growth in sophistication of the way the presentations are constructed. [You] could see some of them learning some of the visual techniques to keep people interested. At first, it's a lot of data and words on slides, but later that turns into some bullet points with a pretty picture to attract the eye. Less clashing backgrounds, color schemes, and more polished overall (theme, Presentation Skills; subtheme, Content/Organization).

He was acutely aware of his accent, and it got worse on his busy slides. One coping mechanism [that he employed]

was to put less per slide so he didn't feel rushed to get through (theme, Presentation Skills; subtheme, General Speaking Skills).

You could see some of the visual techniques to keep people interested, with pictures and audience participation slides (theme, Presentation Skills; subtheme, Audience Participation/Involvement).

Faculty comments about Preparation (11 comments) and Time Management (5 comments) related to presentations were also classified under this theme. Illustrative quotes from the group discussion included

He did some practical things early on with a process for a literature search before his talk (theme, Presentation Skills; subtheme, Preparation).

He commented on allowing more time for discussion, gauging his time, and so on (theme, Presentation Skills; subtheme, Time Management).

### Insights as a Teacher

Thirty-five comments focused on issues of the feelings of residents about teaching and insights into their learners. Comments about residents' feelings as a teacher were identified 16 times. These included being "excited" or finding "enjoyment" as a teacher, "feeling inadequate" as a teacher, recognizing the "role of anxiety in their performance," and describing a change in attitude toward teaching. One typical quote was

He's the 'glass half full' guy. He kinda sees the positive in the things he likes and he likes teaching, which is good. He likes what he does. He says that by how he expresses that he enjoyed his topics and things like that. There seemed to be an energy in how he expressed things (theme, Insights as a Teacher; subtheme, Feelings as a Teacher).

Comments classified in this theme also related to residents' self-assessments of the quality of their teaching (12 comments). An illustrative quote from the group discussion was

Over and over, there was a concern about him being anxious and speaking too fast, and he discussed attempts to address this. He commented on how he did later, in response to internal or external feedback (theme, Insights as a Teacher; subtheme, Self-Assessment).

Comments on residents' insights about the learner were identified 6 times. An illustrative quote from the group discussion was

He took a personal interest in students and tried to understand their motivations and learning needs (theme, Insights as a Teacher; subtheme, Insights about Learners).

This theme, Insights as a Teacher, also included comments suggesting lack of insight as a teacher, such as the comment

It seems from several things I think that [some] had trouble taking personal responsibility when things didn't go well. It was somebody else's issue when something didn't go well, it wasn't ever 'What was my role in that?' or 'How could I then take what I have control over and improve on that?' It was 'somebody else gave me bad advice' or 'somebody else didn't do this or somebody didn't respond to my teaching.' That tendency sort of came out in the portfolio (theme, Insights as a Teacher; subtheme, Feelings as a Teacher).

### Discussion

This article reports a qualitative study of assessor observations of resident portfolios about teaching. Analysis identified 3 main themes that were confirmed by member checking with participating faculty assessors. Triangulating these findings with conceptual frameworks in the literature, we found that our observations were consistent with the 6 Glassick et al<sup>11</sup> standards for scholarly work, namely, (1) clear goals, (2) adequate preparation, (3) appropriate methods, (4) significant results, (5) effective presentation, and (6) reflective critique. Of the 6 Glassick et al<sup>11</sup> standards, "significant results" was the only 1 not represented among our themes and subthemes, confirming that portfolio assessment for teaching and presentations may capture most of the critical aspects of scholarship. Our findings were also consistent with important themes identified in the portfolios of professional teachers, namely, identification of specific learner progress over time, evidence of specific teaching skills, and self-reflection on their skills.<sup>8</sup>

This analysis has several limitations. Most important, the findings may be unique to either our faculty assessors or the structure of our electronic portfolio itself. Given that residents were free to choose their best work as content and could restrict review by mentors, the portfolio may represent a positively skewed view of longitudinal performance. In addition, the portfolio was primarily used for formative feedback and was not a prerequisite to graduate, and our findings may not be generalizable to other portfolio systems that might be used for high-stakes decisions. Also, assessors' prior knowledge of residents' performances may have influenced their impressions of the portfolios, overstating what can be learned solely from a review of the portfolios. A strength of this work is the breadth of findings from the portfolio reviews that can be triangulated with the Glassick

et al<sup>11</sup> standards for scholarship and the review of portfolios of professional teachers.

### Conclusion

Medical educators expend significant effort in improving the teaching skills of residents. This work demonstrates that portfolios can be used effectively to assess the longitudinal growth of teaching skills in 1 medical education program. The themes identified by our qualitative analysis might be used as a scoring rubric to frame an assessor's analysis of those portfolios. Whether using a rubric generated from these themes will improve the quality of mentor feedback and the longitudinal growth of mentees and whether this assessment method can be adapted to assess full-time medical teachers are avenues for future research.

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