

# EXPLORING THE POTENTIAL OF ONLINE APPROACHES TO TEACHING THE "HUMAN SIDE OF MEDICINE": A SCOPING REVIEW

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## Abstract

### Objectives:

The context of learning for students in the health professions is undergoing significant transformation given expanded use of a wide variety of digital, online technologies and tools (Le & Stein, 2001; Sandars & Haythornthwaite, 2007). Medical learners are increasingly engaging in formal and informal, self-directed and collaborative learning across a wide range of Internet-mediated contexts (Sandars & Morrison, 2007; Sandars et al., 2008; Gray et al., 2010). We undertook a scoping review to describe online, digital approaches that have been introduced across a wide variety of medical education contexts to enhance understanding of the human side of medicine.

### Methods:

We completed a focused scoping review of EMBASE and Medline databases over a 15-year period (2000-2014). We used three main search criteria to select articles for inclusion: 1) mediated, online learning; 2) relevant to medical education (undergraduate, postgraduate, lifelong learning, and faculty development), and 3) focused on the "human" side of medicine. We analyzed the articles we identified in relation to a variety of categories, including descriptive article information (year of publication, periodical type [discipline/field], first author country of residence, etc.), the online innovation described (learner group, topic addressed, nature and components of the digital learning approach, etc.), impact and associated challenges.

### Results:

Of the 3,991 articles we considered, 35 met our inclusion criteria. Less than 50% of the articles we included were identified through electronic database searches. Identified articles emphasized opportunities afforded by a dynamically transforming world of Web 2.0 tools and technology. About 75% the articles described innovations in core rather than elective courses. Just over half described learning approaches which were experienced solely online. The remaining involved or could support blended learning approaches. Most of the innovations supported active learning which were often associated with positive learning impacts. More than half of the articles directly described various challenges such as technical/ logistical difficulties (usually administrative), ease of use, or related "awkward interface" design. Curricular challenges included: demands on time, quality of the educational offering, need to enhance integration with the overall curriculum. As is common during the early stage of development of a new area, an overall lack of critical dialogue regarding underlying pedagogical approaches and other quality criteria was noted across the set of identified articles.

### Conclusions:

Digital technologies and tools are transforming educational contexts and learning for medical students. In an increasingly digital world, this review provides descriptive information and insights into the potential for online approaches to teaching and learning about the human side of medicine, including the need to carefully consider how online education focused on this area can best be designed, organized and delivered.

**Keywords:** Online learning, Medical Education, Humanism, Health Humanities, Medical Humanities, Scoping Review.

## 1 INTRODUCTION

The context of learning for students in the health professions is undergoing significant transformation given expanded use of a wide variety of digital, online technologies and tools [1,2]. Our learners are engaging in formal and informal, self-directed and collaborative learning across a wide range of Internet-mediated contexts [3-5]. A number of articles have considered the potential of online learning in health professions education [6-10], for fostering active, collaborative learning while at the same time, generating new information and knowledge. In an early review of available literature, Chumley et al. [11] found web-based education to be equally effective to other instructional methods in relation to learning outcomes, such as knowledge gains and satisfaction.

In parallel to this, humanities perspectives and arts-based approaches are increasingly being introduced in medical education [12-16]. Pedagogical approaches and exercises in this area are typically designed to promote critical thinking, enhance understanding of patients' experience of illness and the patient-doctor relationship, and foster compassionate care of patients and their families, and overall empathic responsiveness to others (including colleagues). These approaches focus on the "human side of medicine" [17], beyond the basic physiological elements of disease and illness. While many humanities-based offerings have been successfully introduced in medical education curricula, limited faculty and face time available in the curriculum (including competing offerings) often present an ongoing challenge in relation to ensuring the continuity of quality contributions over time that resonate with learners.

Not surprisingly, given the creative, innovative contributions of those involved in developing the field of the medical humanities, the potential of online learning has been recognized by early leaders in this area. As an early example, Coulehan and his colleagues [18] used email communication as an adjunct to small-group medical humanities discussions. Students identified enhanced computer literacy as one of the benefits of this approach. Twenty years later our learners are the most digitally connected in history and are fully engaged in a dynamically transforming world of Web 2.0 tools and technology.

The first reference to Web 2.0 technologies has been traced to an article published in by Darcy Dinucci [19,20]. In 1999, Dinucci signalled the beginning evolution of the web from static, content-focused, web-based experience to a more creative medium supporting the direct engagement of users via participative tools and technology. Although there has been increasing recognition of this shift and its relevance for medical education, it was only relatively recently that Kemp and Day [21] called attention to "affordances of technology-enhanced learning" for those involved in teaching the medical humanities.

In a preliminary scan of available literature, we identified a number of systematic reviews which have explored various applications of mediated, interactive technologies and applications including use of social media in medical education [22-24], along with one systematic review on technology-enhanced reflective learning [25] which included only one study that was relevant to medical education (of 34 studies reviewed). Despite the burgeoning use of Web 2.0 in medical education, we were unable to identify any systematic reviews regarding use of these approaches in teaching humanism in medicine. To address this gap, we conducted a scoping review of descriptive articles and research-based articles regarding use of online, digital approaches to support teaching and learning about the human side of medicine to summarize, or map, a broad range of relevant literature in this emerging area.

The primary question we addressed in our exploratory review was: What are some of the diverse ways in which digital, online learning approaches have focused on the "human side of medicine" in medical education? We aimed to: 1) identify and characterize various online learning approaches used in this area; and 2) outline beneficial outcomes and associated challenges.

## 2 METHODOLOGY

Following steps outlined by Arksey and O'Malley [26] and also Levac et al. [27], our scoping review progressed in five progressive phases: 1) identify/ refine the research question, 2) identify potentially relevant articles, 3) screen/ select articles; 4) extract data, and 5) summarize themes. Our progressive search strategy was developed and refined in conjunction with a research librarian (CB). Consistent with scoping review methodology, we included both descriptive articles and research studies, and did not conduct a methods-based quality assessment of published research.

**Phase 1: Identify the Research Question.** An early broad search strategy identified a number of articles and reports regarding use of digital approaches directed to teaching humanism in health professions education. We included eight health and medical/ health professions education, general education, and humanities search databases in an early exploratory search of literature published between 1992 and 2013. Databases included PubMed, CINAHL, EMBASE, Scopus, ERIC, Humanities International Complete, PsycInfo, and Web of Science databases. We used a common set of search terms, as well as thesaurus terms specific to each database for this preliminary search. Criteria for selecting articles at this stage included: 1) involved some form of online learning, 2) directed to, or used by learners in the health professions, and 3) focused on the “human” side of medicine. Additional articles were identified both serendipitously (e.g., various Google searches). Articles we identified at this early stage included a wide range of issues and diverse themes. We subsequently narrowed our focus to articles published that considered online innovations across the continuum of medical education aiming to obtain a manageable number of references, and meaningful context for identifying themes and issues.

**Phase 2: Identify Relevant Articles.** At this stage, we continued with a broad search strategy. Three main criteria were used to search for relevant articles: 1) mediated (interactive), online learning *experience* connected to an accredited educational program (not simply an optional learning resource); 2) directed to, or used by *medical learners at all levels* (including undergraduate and postgraduate education, as well as continuing education and faculty development); and 3) focused on the “human” side of medicine.. We selected relevant articles from our initial electronic database search (outlined above), and also reviewed reference lists of relevant articles, and continued to conduct serendipitous scans via Google searches. We completed a second directed search of EMBASE and Medline, using the Ovid interface. These databases were selected as the primary North American (Medline) and European (EMBASE) sources for literature in biomedicine and health. The final set of search terms we used are listed in Appendix A (<https://sites.google.com/ualberta.ca/edulearn18-pbmetal-supplmnt>). Database searches were limited to a 2000–2014 publication date range to ensure relevancy (i.e., current, Web 2.0 literature), and sufficient breadth (number and range of articles). In addition, articles needed to be available in the English language. All identified articles were exported into a RefWorks account (by CB), and duplicates were removed (by NS).

**Phase 3: Article Screening and Selection Process.** We exported selected article information from our RefWorks database into an MSExcel file (PBM). Following a multi-stage screening process, we (PBM, NS, and BN) first reviewed periodical and article titles (many articles published in veterinary medicine periodicals were screened out at this point). Using a standardized screening template “Yes, No, or Maybe” codes were assigned to our main inclusion criteria: 1) involves a Web 2.0, online approach to learning, 2) curriculum innovation relevant to medical education, 3) focused on the “human side of medicine,” (see Appendix B, <https://sites.google.com/ualberta.ca/edulearn18-pbmetal-supplmnt>). We subsequently carefully reviewed the abstract, and if indicated, the full-text of articles categorized as “Maybe.” Many of these articles were coded “No,” and a few were coded “Yes.” At this stage, all articles coded “Yes” were reviewed by PBM and NS. Ambiguous cases were discussed and a decision to include or exclude the article in the dataset was made. Through this process, it was clarified that while articles would not be excluded on the basis of methodological rigor, sufficient detail and supportive information was required such that a reader could reasonably be expected to achieve a good understanding of the online approach used. Articles that described online approaches to teaching humanistic care within interprofessional learning contexts were included *if* it was clear that medical students were involved; if it was not clear that medical students were involved these articles were excluded. Finally, we also clarified that some evidence of *exploring and making sense of the human side of medicine* was required to include the article in the dataset. Online static repositories of resources in support of humanism and medical humanities education, including online guidelines and quizzes were not considered sufficient in meeting this criterion.

**Phase 4: “Charting the Data” (Data Extraction).** We developed a standardized template to facilitate a descriptive, narrative synthesis of the data. For each article, we charted the following descriptive information: a) year of publication, b) periodical type (discipline/field), c) first author’s disciplinary affiliation, d) country of residence, e) number of collaborating authors, and f) descriptive/ research article. We also extracted information relevant to the Web 2.0 educational innovation described, including: g) learner group (educational level, setting), h) elective/ non-elective, i) topic addressed (aim/ purpose), j) Web 2.0 mediated learning approach, and k) underlying pedagogical approach. Additional descriptive categories used to characterize articles in our data set included: k) positive

impacts described; l) associated challenges (if any), and m) suggestions for future research (see Appendix C, <https://sites.google.com/ualberta.ca/edulearn18-pbmetal-supplmnt>).

**Phase 5: Data Syntheses.** Data were analyzed in relation to the extracted data categories. Grounded theory methods were used to inductively identify and clarify patterns and variability across the articles included in the dataset.

### **3 RESULTS**

#### **3.1 Article Screening and Inclusion**

Our initial database search strategy identified 19 articles published between 2004 and 2014 for preliminary analysis. Additional broad search and literature scanning activities during this period identified an additional 24 articles as potentially meeting our preliminary search criteria. Following a group-based review of the set of 43 full-text articles, 21 articles were excluded as not meeting inclusion criteria we adopted for our refined search strategy. We subsequently conducted a search of Medline and EMBASE databases, again using the inclusion criteria we introduced in our final search strategy. This search resulted in a set of 3,944 articles retrieved. Of these, 99 duplicate articles were removed. The remaining articles were divided among four of the team members. Articles were screened on the basis of the article title and name of the journal in which the article had been published (which often confirmed that the article focused on another health profession, rather than medicine, and was not relevant to medical education). Two hundred and three articles were subsequently reviewed for eligibility on the basis of information included in the abstract. In the absence of an abstract, the full text of the article was retrieved and reviewed. Finally, several meetings were held in which project team members reviewed the remaining 28 articles coded “Yes” or “Maybe,” and consensually decided to include (or exclude) each article as part of the dataset that was subsequently submitted to analysis. Following this review, four additional articles were included in the dataset. During the period of time that articles retrieved from the Medline and EMBASE database search were reviewed, we serendipitously identified another nine articles that met our inclusion criteria (which were not identified by our Ovid interface search of the literature). In sum, we identified 35 articles as eligible for inclusion in our dataset. It was noteworthy that less than 50% of the articles we included were identified through electronic database searches. See Figure 1.

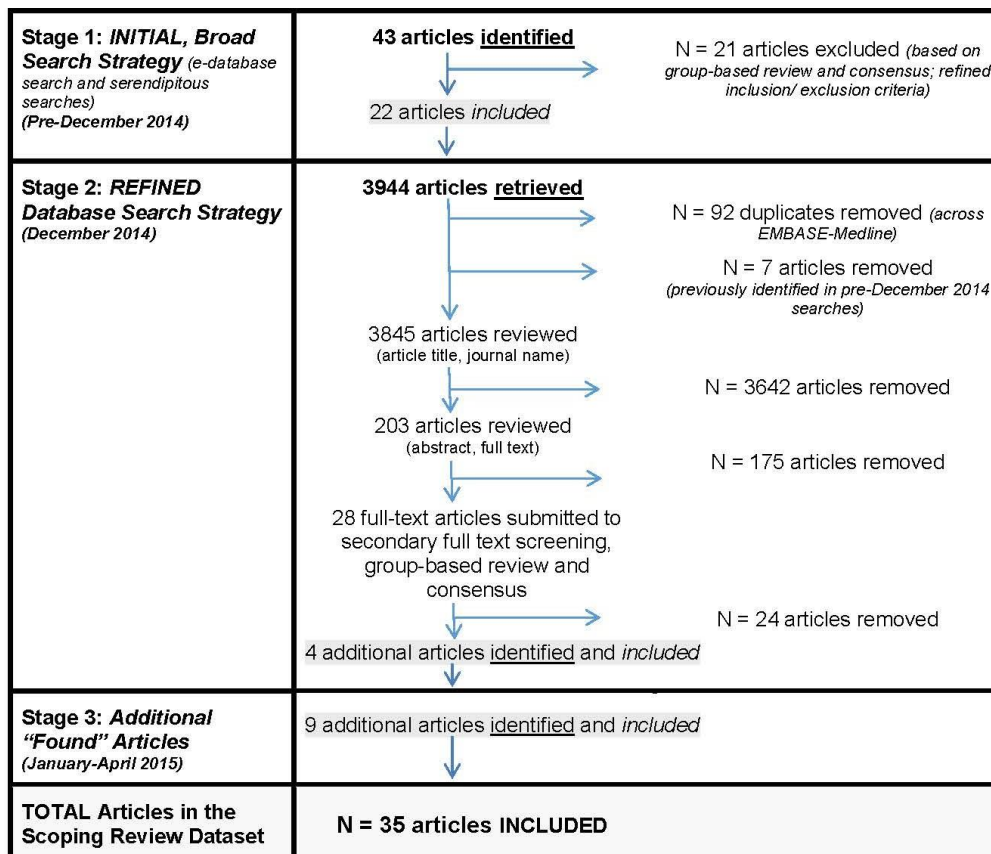


Figure 1. Decision Tree Schematic: Article Inclusion

A complete listing of references for articles included in our final dataset can be found in Appendix D (<https://sites.google.com/ualberta.ca/edulearn18-pbmetal-supplmnt>).

### 3.2 Descriptive Article Information

We organized articles included in our final dataset into three sets: articles published in 2000-2004 (Article Set "A"), articles published in 2005-2009 (Article Set "B"), and those published in 2010-2014 (Article Set "C") (see Table 1, <https://sites.google.com/ualberta.ca/edulearn18-pbmetal-supplmnt>). Over half of the articles were published in the last five years (57.1%, n=20), 34.3% (n=12) were published from 2005-2009, and 8.6% (n=3) were published in 2000-2004. Articles were identified across a varied selection of journals: including a variety of medical and healthcare journals (34.3%, n=12; e.g. *Family Medicine*, *Journal of General Internal Medicine*, *Journal of Palliative Medicine*); medical education journals (48.6%, n=17; e.g. *Academic Medicine*, *Medical Education*, *Medical Teacher*); medical humanities journals (5.7%, n=2; e.g. *Journal of Medical Ethics*, *Cambridge Quarterly of Healthcare Ethics*); and (biomedical) informatics journals (5.7%, n=2; e.g. *Journal of Biomedical Informatics*, *Journal of Medical Internet Research*). In addition we identified an article published in the journal *Biomedical Statistics and Clinical Epidemiology*, along with a conference paper we found on the International Institute of Informatics and Systemics website ([www.iiis.org](http://www.iiis.org)).

Two articles (5.7%) described educational innovations introduced in Russia and Nepal. Seven articles (28.0%) described innovations introduced in the United Kingdom as well as and other member states of the European Union. The country that accounted for the largest number of articles included in our review was the USA (71.4%, n=25); one article described an online, educational innovation that was introduced in Canada. About a third of the articles (28.6%, n=10) offered descriptive accounts of online approaches to teaching that related to the human-side of medicine. Most of the articles (71.4%, n=25) focused on, or included original primary research findings relevant to the educational, online innovation described. These studies used mixed methods (56.0%, n=14), quantitative (36.0%, n=9), and qualitative methods (8.0%, n=2).

With respect to the disciplinary backgrounds of the first authors (not summarized in Table 1), 62.9% (n=22) were physicians with an MD, DO, or MB degree; just over a third also indicated that they had an additional advanced degree. About a third (34.3%, n=12) were educators and scholars with a PhD degree in various areas. The disciplinary affiliation of three first authors could not be determined. About a quarter of the articles (n=9) were single-authored. The mean number of co-authors for the remaining articles was 4.6 (range=2-9). Five of the 119 individuals who authored the articles in our dataset contributed to two articles; one author contributed to three articles.

### 3.3 Web 2.0 Learning Innovations: Descriptive Information

Table 2 (<https://sites.google.com/ualberta.ca/edulearn18-pbmetal-supplmnt>) summarizes information characterizing the Web 2.0 learning innovations described in articles included in our scoping review. The main topics addressed in the articles we reviewed related to humanism (n=19) and communication (n=12). Additional topics, addressed by five or more of the articles included: reflection (n=8), professionalism (n=7), cultural competence (n=6), and healthcare ethics (n=5). The vast majority of the articles described learning innovations introduced in undergraduate medical education programs (91.4%, n=32). Half of these articles described online approaches introduced as part of clinical education during clerkship (n=16), while 40% of the articles (37.5%, or n=12 articles) described educational offerings in pre-clerkship; 12.5% (n=4) of the articles broadly related to all undergraduate years. Very few articles described online innovations introduced as part of residency, or postgraduate education (5.7%, n=2) or in relation to faculty development (2.9%, n=1).

Most of the articles described innovations that were introduced in core rather than elective courses (n=26 vs. n=8). Further, Web 2.0 learning activities were introduced as required component in over 75% of these core courses (n=20 of 26 articles). One article described a modular medical humanities website as being applicable to a “broad spectrum of educational projects and programs,” including both elective and core courses, and provided examples (Article B-10: Wellbery & Gooch, 2005). Just over half of the articles (57.1%, n=19) described educational innovations which were experienced solely online. The remaining involved or, in the case of the medical humanities website noted above, could potentially be used as part of “blended” learning strategy with delivery of content and instruction occurring both in face-face learning contexts and via digital and online media (45.7%, n=16).

Content-driven, web-based learning modules (28.6%, n=10), blogs (25.7%, n=9), “virtual classroom” (20.0%, n=7) and “serious game” (11.4%, n=4) approaches were frequently described. Five articles described other integrated, online learning approaches, including use of e-mail, e-portfolios, e-whiteboard technology, and use social media. Most of the articles described innovations that supported active learning. The majority of these were characterized as highly interactive, with required posting of various kinds of assignments, and facilitated online discussion (57.1%, n=20). Seven articles (20.0%) described innovations which required online submission of an assignment, which we categorized as “passive interaction.” Six innovations (17.1%) involved use of online simulation; several of these described use of “virtual patients.” Two educational offerings (5.7%) involved simple, passive learning approaches (i.e., viewing online informational content, including text and video). In just over half of the articles, faculty instructors were described as being actively engaged in designing (and refining) online learning experiences, facilitating online discussions, and promoting learner engagement (54.3%, n=19). Eight of the articles described limited, administrative roles for faculty instructors (22.9%, n=8). In the remainder of the articles, it was unclear how faculty instructors were involved in ensuring the educational quality of the innovation described.

We rated the relative degree of sophistication informing the pedagogical approaches of the online innovations described in the set of articles we reviewed. Awareness and consideration of both learning theory and best practices related to curriculum design was noted for the majority of the articles (60.0%, n=21). For the remaining articles, little to no information regarding underlying pedagogical models was included (40.0%, n=14). These articles were also noted as being relatively limited in depth and scope. With respect to the level of Web 2.0 technology integration, most articles were rated “medium/high” to “high” (57.1%, n=20). In the educational innovations described, tools and applications were often used to enhance interactive and collaborative learning. Most of these articles were also rated relatively high in relation to the pedagogical approach described.

We also considered the educational innovations described in the set of articles we reviewed in relation to “medical humanities” approaches and “humanism.” Three of the online innovations we reviewed

incorporated diverse perspectives of multiple humanities disciplines. The remaining could be described along a continuum of concern regarding patient- and relationship-centred aspects in medicine (e.g., deepening understanding of the significance of the patients' experience of, and meanings associated with their illness, or deepening understanding of professionalism). Most articles were rated "medium/high" to "high" in relation to humanism (62.9%, n=22). Educational innovations which focused somewhat more on knowledge and skill acquisition in limited areas (e.g., communication or interviewing skills) tended to receive lower humanism ratings.

### **3.4 Web 2.0 Learning Innovations: Positive Impacts and Challenges**

Table 3 summarizes information regarding positive impacts and challenges described in articles included in our scoping review dataset (<https://sites.google.com/ualberta.ca/edulearn18-pbmetal-supplmnt>). Over half of the 25 research-based articles (n=14) provided quantitative evidence of positive impact in relation to empathy, knowledge (based on test scores and "sense of preparedness"), beliefs and attitudes relevant to a broad range of patient care areas (patients with limited English proficiency, patients with substance use disorders), as well as communication skills and professionalism, generally. Eight research-based articles focused on process-related variables and learner satisfaction and also described positive benefits of using online, digital approaches. In Article C-1, Barone et al. (2011), for example, noted that a clerkship director valued use of an online module as an efficient, engaging means of introducing relevant content to clerkship students. Several articles noted "no differences" between online and traditional learning approaches. For example, Article C-16, Fischer et al. (2011) noted no differences in levels or kinds of reflection across written essay and blogging conditions, and concluded that blogging offers an effective option for reflective exercises. Many of the articles that were characterized as incorporating a blended or interactive, online learning approach described the opportunity that existed for supporting the emergence of learning communities.

While two other research-based articles described advantages to using online approaches to teaching the human-side of medicine, somewhat disappointing outcomes were also noted. In Article B-2, Cleland, et al. (2007) noted that completion of a web-based, self-directed learning module was not associated with workplace assessment of skill in sharing bad news. Reporting on the experience of an optional, online group to support ongoing discussion as part of a medical humanities module introduced within the context of a developing nation (Nepal), Shankar and Piryani (2012) [Article C-19], noted low levels of learner engagement which were described as disappointing.

Thirteen articles did not describe or refer to, directly or indirectly, any associated challenges. A wide range of challenges were described in the remaining articles, including those that related to learner engagement, for example: technical/ logistical difficulties (usually administrative); ease of use, or challenges associated with an "awkward interface" design. Curricular challenges included: demands on time, quality of educational offering, and need to enhance the curriculum in various ways (two articles suggested the need to develop a blended learning approach). Challenges for faculty were described. Given demands on the time of faculty instructors and facilitators, need for additional faculty tutors was noted. Faculty development was also noted as a need. Finally, evaluation and funding challenges were described. The ongoing availability of resources was noted by the study team, when at least one of the online modules was determined to no longer available to medical educators.

Twelve articles (34.3%) provided no or very sparse description of what was involved in creating or developing the online, digital innovation. For the remainder, the process involved in introducing e-learning innovations ranged from minimal to considerable expertise and effort required to design and deliver the curriculum. A quarter of the articles (25.7%, n=9) did not include any suggestions for future research. The remainder either identified limitations of their study or educational approach, and/ or offered specific suggestions for future research based on outcomes observed and described in each article (see Table 3).

## **4 CONCLUSIONS**

Beginning in early 1960s concern for the human side of medicine emerged as a focus of discussion within the context of technological advances in medicine and need to regain or secure public trust. Over the past few decades, there has also been increasing interest in the potential role of the humanities in re-humanizing medicine. In the current period, our learners are the most digitally

connected in history and are fully engaged in a broadly mediated world of Web 2.0 tools and technology. Kemp and Day [21] have recognized this shift and its relevance for those engaged in teaching the medical humanities. In their recent overview, they describe a range of technology-based opportunities for enhancing reflective learning and also encouraging collaborative learning in the medical humanities. Cook and Dupras [24] however offer a cautionary note in relation to web-based prospects and possibilities, arguing that e-learning is effective only insofar as “best educational principles” are applied.

Of the 3,991 articles we considered across the 15-year period beginning with the introduction of Web 2.0 technologies, 35 met our inclusion criteria. We included both completely descriptive articles, and those which included an evaluation or research component. It is noteworthy that relatively few of the articles we included in our scoping review dataset were identified through database searches. This suggests that this emerging area is not yet easily identifiable with respect to MESH search terms. Still, we found a wide variety of educational innovations that were developed and piloted in Russia and Asia, the European Union and North America. Articles were published in a broad range of journals, and typically involved the contributions of multiple, interdisciplinary authors. Online, digital approaches to learning about the human-side of medicine are clearly being developed and introduced. This scoping review provides a glimpse at the creative ways medical educators have made use of digital approaches to teaching and learning in relation to a variety of subjects and concerns that relate broadly to the “human side of medicine.” In considering the growth and development of the medical humanities over the past few decades, Chiapperino and Boniolo [29] have described one view of the field in relation to the contribution of various disciplines to an overall conceptual analysis of medicine. They have also described an alternate view which emphasizes the contribution of medical humanities in relation “to fostering a depth of human and humane understanding of the professional-patient relationship (MHs as an existential framework)” (p. 378). The vast majority of the articles we reviewed focused on this goal.

We are at an early stage of development of this field. Still the results of the articles we identified were overwhelmingly positive in relation to the goals specified in relation to teaching and learning about the human-side of medicine in support of humanistic care. Identified articles emphasized opportunities that digital approaches offered in relation to enhanced engagement of learners, as well as the potential for supporting the emergence of learning communities. We were impressed by the creativity and quality of the pedagogical innovations we reviewed, which supported individual and collaborative learning through relational learning approaches. Not surprisingly, given the early stage of development of this area, a critical, coherent dialogue regarding underlying pedagogical approaches and other quality criteria has not yet developed.

Technology is changing education faster than ever. Connectivity is changing the way students learn and is reshaping education at a rate which may be difficult for medical schools to accept and embrace given the change required by the digital revolution. We believe that the findings of this scoping exercise will help bring into view the possibilities that exist in relation to engaging technology to promote awareness of, and advance humanism in medicine. Given the broad range of collaborative Web 2.0 tools that are currently available, we can imagine that very soon learners themselves will, or have likely already begun to contribute to the creation, of online, digital approaches to learning about the human side of medicine. As educators, we might also want to explore and make use of the broad array of collaborative Web 2.0 tools that are available to support engaged sharing and open discussion regarding the possibilities of digital, online approaches to learning about humanism and the “human side of medicine.” For example, it may be helpful to create a repository of online modules and educational resources and related discussion boards to support advances in this area.

In the foreseeable future of our collective digital world, both current and future generations of medical learners will continue learning online. We believe it is not an option to not advance understanding of the potentials of the technology, and approach this with a view to ensuring quality in relation to underlying pedagogical approaches, curricular design, and integration of Web 2.0 tools and technology in support of learning about the human side of medicine. Attention given to the art and aesthetics of learning can enhance understanding of the “art of medicine,” just as it can enhance learning in other areas. With respect to the potential of online learning, we also need to carefully consider how educational efforts focused on the human side of medicine can best be organized and delivered both locally, within our own medical school contexts, and also collectively, with a view to



making our contributions available to others - to be adopted, adapted, or simply to inspire new innovations in this area.

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Table 1. Online Approaches to Teaching the "Human Side of Medicine" (2000-2014): Description of "Included Articles"

Table 2. Teaching the "Human Side of Medicine" (2000-2014): Characteristics of Online Teaching and Learning Innovations

Table 3. Teaching the "Human Side of Medicine" (2000-2014): Positive Impacts and Challenges associated with Online Teaching and Learning

Appendix A: Detailed Search Strategies for Medline and EMBASE

Appendix B: Standardized Screening Template

Appendix C: Standardized Data Extraction Form Fields

Appendix D: Reference Listing for "Included Articles"

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