



Approaches for Departments, Schools, and Health Systems to Better Implement Technologies Used for Clinical Care and Education

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Rapidly shifting how health care and business are managed, technology can enormously impact the quality of service care delivery, education/training, faculty development, and administration in academic health centers [1, 2]. While the shift to include technology is consistent with the Institute of Medicine's health professional education movement, the question is how to efficiently do that in a metric-, data-, and reimbursement-driven care era [3–5]. Leaders of departments, schools, and health systems are obliged to understand the external forces at play related to health care, which push for “faster, cheaper, better” services [6, 7]. Technology creates challenges to overcome such as clinical competence, as well as uncertain cost and operational requirements [4].

To date, the most widely researched and implemented technology in psychiatric settings has been telepsychiatry (TP; video) or telebehavioral health (TBH). Randomized controlled trials show that TBH is effective and comparable to in-person care via a variety of models [8–11]. Guidelines by the American Telemedicine Association in 2013 and 2017 [12, 13] provide clinical, administrative, and technical contexts. Psychiatric leaders must now also consider social media, mobile health, apps, and other technologies—each associated with assorted benefits, risks, and costs.

This paper is designed to help leaders “step back” and broadly envision how academia and technology may reasonably interface. If psychiatric faculty and administrators fail to technologically progress, young professionals may opt toward other technology-hip areas of medicine, and clinical boundary and privacy violations may become more common. This paper complements the curricular and competency papers [14–18], which provide more operational, concrete examples for faculty, residents, and administrators. This paper aims to help readers in three ways:

- 1) To understand the technology-related skills, attitudes, and knowledge for clinicians and trainees to ensure the quality of care
- 2) To provide an approach to make change with technology: (1) assess readiness; (2) create/hardwire the culture; (3) write policies and procedures; (4) establish the curriculum and competencies; (5) train learners and faculty; and (6) evaluate/manage change
- 3) To provide principles of an approach in the form of institutional competencies to help integrate technology into core academic missions

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Technology-Related Skills, Attitudes, and Knowledge for Clinicians to Ensure Quality of Care

Technology and Clinical Care

Technology may impact the therapeutic frame, trust/safety, and expectations [19, 20]. Clinicians can explore patients' requests, needs, and preferences about technology through the consent process, though some patients use technology spontaneously after the fact [16, 20]. Regardless of the technologies used, the therapeutic frame must adhere to clinical, legal, and ethical mandates (e.g., planning for emergencies at a

distance, privacy). Clinical care systems must specify how technology is used in personal versus professional relationships (e.g., text messages during business or after hours; not using personal cell phone for care). It is also important to clarify in which circumstances specific technologies should (or should not) be used (e.g., a telephone call instead of posting suicidal thoughts on social media). New options like “emoticons” or emojis are increasingly popular and contribute to social communication, but they have drawbacks, too. They may not adequately capture the nuances of feelings expressed in-person or by written words, and they may be confusing at times [18, 21, 22].

Technology-associated change impacts many areas of clinical care, training, and faculty development [14, 23]. Areas being explored include the computer-based patient record or electronic health record (EHR) (e.g., workflow time and burn-out) [24], adjustments of educational Milestones [25], technology-assisted clinical handoffs [13], social media use [16], electronic health portals [26], artificial intelligence for diagnosis [27], registries for clinical care and research [20], e-diaries for longitudinal collection of patient symptoms [28], and use of email, apps, and games [20, 29, 30].

Fundamental Steps for Departments and Systems to Implement and Evaluate Technology

An approach to technology across clinical, academic, and administrative missions is suggested, since telepsychiatric services, social media, and other technologies are evolving quickly [14, 31–33]. The assessment of readiness for change is one of the several suggested institutional competencies [14]. Specific areas to evaluate are as follows: patient-centered care; evaluation and outcomes; roles/needs of participants (e.g., trainees, faculty, teams, professions); teams, professions, and systems within institutions; and the academic health center institutional structure, process, and administration.

To guide the process of implementing new technologies, a suggested approach is outlined: (1) assess readiness; (2) create/hardwire the culture; (3) write policies and procedures; (4) establish the curriculum and competencies; (5) train learners and faculty; and (6) evaluate/manage change.

Assessing Readiness for Change

Institutions have to assess readiness to change at the participant, program, and organizational levels (Tables 1 and 2). Individual participants (i.e., faculty, clinician, staff, and trainee) need to understand expectations (e.g., skills they will be expected to master), the degree of anticipated change, and the impact of change on day-to-day work; these matters affect morale and workplace climate. Programs need good communication,

Table 1 Checklist of factors to help organizations measure readiness and implement change with technology

Participant level: faculty, clinicians, staff, and trainee
1. Outline of skills, competencies, and best practices for change
2. Level of innovation required (i.e., incremental, radical, transformative)
3. Linkage of technology with health care outcomes and/or deliverables to end-user(s) (i.e., patient, staff, clinicians; trainees, faculty; interdisciplinary teams)
4. Rewards/incentives at all levels (what managers and employees get for changing)
5. Morale (spirit and trust in the workforce)
Program and system evaluation levels
6. Measurements (ways of determining achievement of change)
7. Organizational climate (context and events pertaining to the change)
8. Organizational structure (flexibility and stability)
9. Culture of quality improvement and prior experience with change (degree of success)
10. Ownership of all participants and responsive decision-making by leaders
Organization level
11. Sponsorship (endorsement of change from the top) and leadership (day-to-day support for change)
12. Motivation from top management to implement change and willingness of participants
13. Direction (clear vision of what should result from change)
14. Competitor benchmarking (how other competitors are doing with similar changes)
15. Communication (open, two-way) about the change involving technology

collaboration, and teamwork. Organizational-level sponsors must outline the motivations for change, communicate change plans, and provide context for necessity (e.g., comparing to competitors' initiatives) [34]. External consultants may help evaluate the organizational climate and the degree of participant flexibility.

Experience in both business and health care sectors suggests a cautious approach to change implementation [35, 36]. Technology-associated innovation might be *incremental*, with minor changes to current services/products (e.g., add processes) or *radical*, via a major breakthrough or discovery. *Transformative* change may be simple and/or complex, but generates significant value. In the short term, disruptive innovation occurs if the focus is too big, only a minority of people is helped, a paradigm shift for many is needed, and other business practices are contradicted. In the long term, with patience and time, participants may feel empowered and see value in improved customer/patient service and efficiency.

Suggested strategies and steps are outlined in two tiers to provide options for departments and institutions. At a *minimum*, it is suggested to (1) assess clinical service technology platforms for video, e-mail, and other common technologies; and (2) assess structure/function of social groups of a

Table 2 Competencies for institutions/academic health centers for telebehavioral health and e-competencies

Competency focus	Foci	Evaluation	Tips related to technology
Patient-centered care	Input on care models and treatment options Offer multiple points-of-entry Screen for technology use	Assess the “whole-person,” customer service (e.g., care coordination and communication)	Offer range of technology options Import social science, health behavior, and business ideas
Evaluation and outcomes	Link behavior to outcomes for a patient or program Use evidence-based measures	Use a technology platform Use technology-specific measures	Use benchmark plan for clinical accreditation: goal, measure, benchmark, target, and data
Trainee/student needs/roles	Patient- and learner-centered outcomes Prepare as resource manager Clarify personal versus professional technology use	Link supervision to care and learner skills Use 360 evaluation Monitor wellness and professionalism	Use quantitative and qualitative approaches Use observation, video, and simulation Role model healthy behaviors
Faculty clinical, teaching, and leadership roles	Emphasize communication, wellness, and professionalism Use technology as a lifelong learner/teacher Emphasize resource manager technology leadership role	Monitor wellness and professionalism Define success based on teams, systems, and populations	Use social science, health service, and business constructs Use longitudinal approaches Use technology for portfolio, curricula, dissemination, networking, and other purposes
Teams, professions, and systems within institutions	Assess structure/function of social groups that govern behavior of a community Use faculty development with teams, projects, and professions to build skills	Foster alignment across systems Organize goals and outcomes for success based on teams, systems, and professions	Align shared outcomes: Patient/clinician outcomes Learner/teacher Clinic/system Institution/community
AHC organizational structure, process, and finance	Use technology platform Weigh human resources, technology, and cost issues Build AHC-community partnerships to share resources and integrate care Align missions and values Use faculty development projects to shift culture	Provide easy access Assess context, pace, scope, and drive of/for change Be proactive not reactive Strive for incremental, sustainable solutions Measure technology in performance evaluations and provide feedback	Monitor private, federal, state, and other sectors Seek technology grant funding (e.g., Office for Advancement of Technology) and partner with agencies (e.g., Federal Communications Commission) Use/adapt others’ evidence-based system approaches

community to focus workflow changes and training. If resources are available, *additional* suggestions are to (1) assess need and capacity for advanced technologies (e.g., mobile health wearables, devices); and (2) assess the need for system-wide training and other interventions to move from current to target architectures.

Create/Hardwire the Culture

Since technology is a tangible part of health care and academic missions, adapting ideas from its use in business may be helpful. Fundamentally, progressive business practice has shifted information technology (IT) *from* an appendage *to* a core, integrated component. IT is now interlaced with research and development, marketing, production, and financing functions—as an organizing framework—and this is referred to as a shared IT-business understanding [37]. For health care, technology use requires clinical skills, technical support, and team workflow adjustment—so planning and evaluation must cover these landscapes.

As for strategies and steps, at a *minimum*, it is suggested to (1) prioritize telephone, e-mail, and video implementation before mobile health options due to ease, cost, and other factors; adjust the physical plant (i.e., lighting) and technology, if needed; and (2) select technology infrastructure platforms (e.g., the EHR) so in-person and TBH cares are integrated, support e-information flow, and assist health professionals’ decision-making. If resources are available, *additional* suggestions are to (1) delegate a clinician champion and a teaching faculty to learn and implement clinical competencies to steer training and faculty development; and (2) design clinical technology workflows (e.g., a virtual waiting room), adjust policies and procedures, and assess if mobile health and social media platforms are needed.

Write Policies and Procedures

The overall administrative approach should attend to process, procedures, policy, and evaluation in order to plan, implement, and manage a program. Input from all levels of the

organization—including clinician, manager, and technology stakeholders—should help ensure fidelity to the plan, reduce uncertainty, and improve effectiveness.

As for strategies and steps, at a *minimum*, it is suggested to (1) use/build templates for consent, intake, and ongoing care processes; and (2) amend and/or add departmental and system policies and procedures (e.g., policy on use of social media); evaluate if patients and clinicians are informed and adhere to these. If resources are available, *additional* suggestions are to (1) collaborate with school, health system, and community partners to support video use in clinical, educational, and research missions; and (2) build in a quality measure that can be used for in-person and TBH cares (e.g., Telemedicine Satisfaction Survey) from a lexicon of options [38, 39].

Establish the Curriculum and Competencies

Telepsychiatric (2015, 2018), broader TBH (2017), social media (2018), and mobile health (2019) competencies were designed to support clinical care, training, faculty development, and administrative missions [14–18]. Most frameworks use the Accreditation Council of Graduate Medical Education domains [25]. The original TP competencies were subdivided according to the Dreyfus model for learners into novice/advanced beginner, competent/proficient, and expert levels [14, 18, 40]. Clinical and administrative-based issues related to care include documentation, EHR, medico-legal, billing, cultural, confidentiality, and privacy (e.g., Health Insurance Portability and Accountability Act; HIPAA) [14–18, 41].

Implementing an e-culture and teaching associated competencies successfully will likely require a mixture of methods to increase learners' skill level over time. The mixture may include clinical rotations, seminar, supervision, research/quality improvement projects, and case-based learning [14–18]. A framework for program evaluation [42] and Kern's six-step approach to curricular development are suggested: (1) problem identification, (2) needs assessment, (3) goals and objectives, (4) identifying educational strategies, (5) implementation, and (6) curriculum/program evaluation and feedback [43]. Clinical informatics ideas are also available to help directors of training programs implement curricula and rotations with supervision [44].

As for strategies and steps, at a *minimum*, it is suggested to (1) embody technologies in the residency seminar(s) and offer TP clinical rotations, focusing on one competency each for telephone, e-mail, and video; and (2) encourage program and clerkship directors to select, develop, and adapt regular milestones to include technologically based competencies. If resources are available, *additional* suggestions are to (1) employ a multi-year residency curriculum including informatics, adjust core rotations, and add a required advanced-year clinical rotation in TP; this could include three competencies for video and one for mobile health and social media; and (2) identify a vice-chair of education (or clinical services) or other

advanced career faculty members to promote technology and liaison with salient national psychiatric organizations.

Train Learners and Faculty

Faculty may be variably interested in TP/TBH practice, so all programs will best serve their trainees' professional development needs by identifying faculty thought leaders or champions of these increasingly important modalities. They can link to others through national educational organizations such as the American Association of Directors in Psychiatry Resident Training, Association For Academic Psychiatry, American Association of Technology in Psychiatry, and the American Directors of Medical Student Education in Psychiatry.

For technologies involving social media, the challenges are greater. Fortunately, some faculty already use social media for career development, professional advancement, and clinical and teaching purposes. Platforms such as Twitter® and LinkedIn® are extensively used internationally and provide a range of benefits for networking and promoting scholarship—new, fast ways to disseminate innovations (e.g., electronic pre-publishing of articles, blogs) [45, 46]. For social media, thought leaders and champions for education and implementation might well come from trainees as easily as from faculty, essentially instituting what the anthropologist Margaret Mead called a “prefigurative” learning culture, in which the young teach the old [47].

As for strategies and steps, at a *minimum*, it is suggested to (1) provide didactics (e.g., bedside, seminar, grand rounds) upon research, trends, and relevance of TP and to correct misconceptions; this may engage/interest learners in educational opportunities and provide content knowledge more than to develop attitudes and skills; and (2) use case-based learning to deepen content knowledge, to begin to apply and generalize knowledge to real-life examples, and to practice developing treatment/management plans. If resources are available, *additional* suggestions are to (1) provide clinical rotations to practice skills related to patient care, gain exposure to various populations, observe role models, and obtain feedback from supervisors; and (2) use group observed, co-interviewing, and/or simulation to focus on engagement, interpersonal, and communication skills, and to build consensus on pros and cons of TP.

Evaluate/Manage Change

Change requires leadership and management approaches for technology across multiple clinical, academic, and administrative missions [14]. Change may be facilitated by use of opinion-leader visits and discussions, survey instruments, focus groups, site visits, in-person and on-line courses, and external consultants [48]. Inevitable, foreseen, and unforeseen negative consequences of such disruptions require skillful management [34, 35, 49, 50].

As for strategies and steps, at a *minimum*, it is suggested to (1) evaluate both in-person and TBH cares with standard (i.e., Joint Commission) and supplemental (e.g., Telemedicine Satisfaction Survey) measures [37, 38]; and (2) provide funding infrastructure (e.g., pilot projects) to support technology-based evaluation and health services–based quality improvement projects. If resources are available, *additional* suggestions are to (1) add research and funding infrastructure for technology-based pilot and full-scale projects, focusing on those that impact health service delivery across training programs and services; and (2) advance academic and community missions via partnerships for video and other technology applications to clinical, educational, and research missions.

Conclusions

New technologies create opportunities and challenges that significantly impact education, health care, and business. Leaders in academic health centers and departments of psychiatry already exploring TP or TBH must also consider integrating social media, mobile health, apps, and other emerging technologies related to clinical care, training, faculty development, and administrative missions. Successful implementation of technology requires hands-on leadership, needs assessments, participation by all levels of the organization, and continuous quality/performance improvement to support a positive e-culture. Additional research is needed to develop consensus regarding priorities, prototypes, standardization, and best implementation strategies.

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Compliance with Ethical Standards

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