How Technology Changes Everything (and Nothing) in Psychology

2008 Annual Report of the APA Policy and Planning Board

The 2008 Policy and Planning Board of the American Psychological Association (APA) was chaired by Rochelle M. Balter, PhD, JD. Other members of the Policy and Planning Board included Mathilda B. Canter, PhD; John F. Dovidio, PhD; G. Rita Dudley-Grant, PhD; Elena J. Eisman, EdD; Paul D. Nelson, PhD; John C. Norcross, PhD; Lisa Porche-Burke, PhD; and Morgan T. Sammons, PhD. James H. Bray, PhD, was the liaison for the Board of Directors. APA Bylaws Article XI.7 requires that the Policy and Planning Board report annually by publication to the membership and review the structure and function of the Association as a whole every fifth year (APA, 2008).

It seems that every day, in some conversation or another, the talk turns to technology. It can be about the delight taken in a well-designed website or the ease of accessing data when one needs it; it can be a 50-something-year-old complaining that the BlackBerry needs to be redesigned for newly arthritic baby boomer fingers; it may be a parent boasting about a young child's mastery of electronic equipment or complaining about a teenager's obsession with instant messaging, text messaging, or Facebook. The conversation might also involve a psychologist voicing concerns about the lack of confidentiality of electronic health records or complaining about being inundated with e-mails from colleagues, patients, and listservs.

Although the pleasures and frustrations of technology are now widely recognized in personal life, in the classroom, and in the boardroom, technology's impact on social and organizational life is often not fully appreciated. Putnam (2000), in his book *Bowling Alone: The Collapse and Revival of American Community*, however, has alerted us to the significant ways in which technology is shaping social life. In this article, we take a more focused view by exploring the fundamental implications—positive and negative, immediate and long term—that technology has for the science and practice of psychology and, more directly, for the APA.

Technology's Influence on Human Psychology

Today's world is characterized by new technologies emerging at an unprecedented rate. The future is no longer tomorrow but within the next 10 minutes. Rapid and dramatic changes are occurring in all areas of human communications and relations through innovations such as the cell phone, texting, instant messaging, and online services. Even from the time this report was written to the time it went into press, even newer technologies have emerged.

Technology has become a fundamental force in shaping the identity, cognitive and affective processes, and social activities of our students, clients, and research participants. Whereas the family was once by far the most important environment for shaping attitudes and beliefs, today young children are exposed, via TV and the Internet, to many more role models, values, ways of thinking, and choices than ever before. Video games allow people to construct and experience virtual realities unconstrained by the norms and values of general society (Gentile, Saleem, & Anderson, 2007). Beyond fantasy, information and communication technologies have changed the nature of peer groups. Through technology, people can create new reference groups with idiosyncratic norms rather than being socialized primarily through more conventional means. The Internet supports the forming of alternative communities (Turkle, 1996) around shared ideas rather than only through physical contact. Virtual communities can provide companionship for people otherwise deprived of close personal interaction.

Cell phones, iPhones and BlackBerrys, e-mail, instant messaging, twittering, and texting, which are an integral part of the MySpace generation's lives, shape everyday attitudes, values, and relationships in fundamental ways. What we have traditionally considered "isolated behavior" may represent, in the eyes of its desktop participants, a new definition of "connectedness." What we have viewed in the past as "instant gratification" or "impulsivity" may, through the current generation's eyes, be seen as living at appropriate speed! These new perspectives and ways of socialization and influence are obviously important for psychologists to understand in order to study and work effectively with newer generations.

There is no doubt that new technologies have advanced the human capacity for rapid communication in unprecedented ways. However, rapid social change, even with apparent tangible benefits, often has some negative—unintended and indirect—consequences. For example, the Internet can be a tool that enhances opportunities to harm others among people already motivated to do so. Cyberstalking and cyberbullying are recognized social problems, as are cyberscams that not only result in immediate monetary loss but also have profound long-term consequences such as identity theft. Moreover, technology can be used to shape worldviews that support and promote extreme beliefs

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and behaviors. Unusual, even potentially dangerous, ways of thinking about others can become "normal" within a virtual community (e.g., as within online hate groups). The Internet provides some with the illusion that they are in complete control and may direct all actions from the keyboard. Ease of access, anonymity, and disinhibition make it safe to say almost anything with few consequences and contribute to the phenomenon of Internet addiction, which is being considered as a diagnostic category in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders*.

Beyond their role in these extreme forms of behavior, new technologies can have a pervasive influence on more "normal" activities. Perhaps because of the speed of change associated with recent technologies, the full nature of their impact on people's social lives is still unclear. Some researchers have concluded that the new communications technology significantly alters value systems and social networks (Bugeja, 2004). People are spending more time communicating in broader social networks, but this broadened communication comes at the expense of relationships with those in their immediate physical environment. Other investigators, however, found little negative impact on the frequency of face-to-face relationships (Bargh & McKenna, 2004; Rosen 2007; Underwood & Findlay, 2004).

Technology can affect not only how much people interact with others but also the *ways* in which they interact. Gender differences are often more pronounced in virtual than in face-to-face relationships. Men tend to have a more sexualized approach to online relationships, whereas women focus more on sharing personal information and intimacy in online discussions (Bell, 2007; Underwood & Findlay, 2004). The Internet, instant messaging, and text messaging have encouraged impatience and expectations of an immediate response among their users, compared with previous generations, who left messages on telephone answering machines and waited for a response (Bernstein, 2005). Moreover, the limitations inherent in computer-based communication with others can impede the full development of close relationships (Bargh & McKenna, 2004). Missing in many current forms of technology-mediated communication are the nuances associated with facial expressions, voice tone, inflection, and many other nonverbal aspects of communication. These communications can then appear to lack authenticity and synergy. One of the latest and more popular social blogging modalities is Twitter, which is often used in business and research. Twitter now allows users to send messages of up to 140 characters (tweets) answering the question "What are you doing now?" It tends to be self-oriented and may promote a type of narcissism rather than the sense of connectedness and social support desired.

Despite the enormous potential of new technologies for increasing shared knowledge and connecting people who are geographically distant, technology can exacerbate social divides. For members of different racial and ethnic groups, who are often cautious and mistrustful of each other, even minor disruptions in electronic communications (e.g., slight delays in transmission) arouse anxiety, increase tension, and create negative interpersonal and intergroup impressions (Pearson et al., 2008). If two groups are trying to formulate policies based on mutual concessions and one group proposes a change that does not receive an immediate supportive response from the other group, this lack of response may be interpreted not only as nonagreement but possibly as condescension (in not even honoring the suggestion with a response).

The *digital divide* is a term that describes how technology can create or increase gaps between various populations. These gaps occur across socioeconomic status and age groups not only within the United States but also internationally. Developing countries face problems in attempting to keep up with ever-expanding technological advances in communication. The information revolution "can make some of the historical problems of lack of opportunity extraordinarily more acute," concluded Yolanda Comedy, senior policy analyst for the President's Information Technology Advisory Committee (Foxhall, 2000).

So, does technology promote social connectivity or produce social isolation? There is no clear answer, and the answer can change as people adapt to newer forms of communication technology. At present, though, the simple answer can be "both." Technology makes most things, including socializing, more efficient, which may result in more leisure time (Robinson, Kestnbaum, Neustadtl, & Alvarez, 2000). However, as Nie, Hillygus, and Erbring (2002) contended, time is a zero-sum system, like a hydraulic system, in that time can be reshaped or redistributed like a fluid but cannot be expanded like a gas. Hence, time spent online competes with and displaces face-to-face social time. What suffers most, though, are those aspects of interpersonal relationships that require the most effort and investment—the key elements of quality time. Skype use is an example of both the positive and the negative aspects of technology. Skype can be used to maintain some visual contact so that family members can "see each other." It can serve as an effective stress or worry reduction tool for adult offspring who can check in on parents who may have medical problems or for parents of teens who may be away at college; however, it may also be seen and used as an excuse not to have in-person contact with family members. In addition, it may be seen by both younger and older generations as an intrusive tool used to keep them in check. Although technology usage has enormous potential for bridging cultural, national, and socioeconomic differences between people, the digital divide in access and skill levels can create even greater fissures between groups whose relations may be socially fragile and potentially contentious.

Besides its pervasive effects on the people whom psychologists study and treat, technology has directly influenced the most fundamental activities. In the next section we consider how technology shapes education, research, and practice in psychology.

Technology and Education

Although technology per se is not new to the education process of teaching and learning, education is one of the

areas most heavily impacted by technology. The Internet and related technologies have the power to bring literature, research, information, and people from around the world directly into the classroom. Experts lecturing in California may be seen via "webinar" simultaneously in New York, Tokyo, and London. All may share in the expertise and interact with the expert and other students. Such a capability has had a transformative effect on traditional conceptions of formal learning environments (e.g., the classroom or the laboratory) and pedagogy (e.g., forums and methods of teaching). Even the traditional concept of the college or university has expanded from that of an institution in a particular locale to an institution of learning without geographic boundaries. Technology has made advanced education more accessible to more people, particularly those for whom geography and immediate personal demands were barriers.

Psychology has been among the leaders in academic disciplines advancing technology as a pedagogical tool (see Benson, 2008; Davis & Buskist, 2002). New technologies in the form of high-speed, handheld or desktop computers with Internet capability not only afford access to information on a global level but also can improve the way information is conveyed in the classroom and can enhance the amount and quality of interaction among students and instructors. Material can be presented in more vivid ways than in the past, which may engage students more actively. The widespread use of software (such as PowerPoint) that incorporates text, graphics, and audio and video clips creates multimedia presentations that are often more dynamic than traditional lectures. When these materials are posted on the Internet, students are freed from the tedium of writing down details to concentrate on understanding the material as it is presented. "Virtual laboratories" can provide students with access to resources that might otherwise be prohibitive in cost or limited in availability (e.g., equipment).

Both inside and outside the classroom, instructional software may promote interaction among students and faculty. For example, instructional website programs can include photographs of students so that instructors and fellow students can interact in more personalized ways. Clickers enable teachers to understand how well the class understands material and are a vehicle for making students more active learners, particularly in large classes. Technology facilitates asynchronous learning. Communication outside of class through e-mail and class discussion sites permits even the shyest student to become directly involved in class activities and to approach faculty members with questions in a timely manner, often as the questions arise, while working on a class assignment. However, such interaction may place extended time demands on faculty and has also resulted in two or more classes being taught simultaneously in different locales by one faculty member via Internet transmission.

Despite the many virtues of technology in the classroom, its limitations and challenges also need to be recognized. Most basically, technology can be expensive; not all schools, including colleges and universities, have the resources to benefit from the types of innovations (e.g., clickers) we have identified. Beyond issues of access, the benefits of technology can also be limited by how it is used. Former Librarian of Congress Daniel Boorstin (1980) highlighted the critical distinction between information and knowledge. Information represents potentially relevant but often diverse facts about a topic or issue. Knowledge is the result of cognitive work reflected in integrative, synthesizing, evaluative, and critical thinking about information. Information is the raw material, but knowledge is the foundation of education. The challenge for educators in psychology, as well as other disciplines, in a technology-rich environment is to remain focused on how best to promote knowledge and learning outcomes rather than simply being a source of information.

Another challenge for educators involves the distinction between entertainment and true intellectual engagement. Will Richardson (2006) reminded us that technology is but a tool for teaching and learning; it is not a substitute for those educational processes. The multimedia nature of current technology can captivate students with relative ease. Interactive technology can make students feel engaged. It can also raise students' expectations about being stimulated visually in the classroom. Visual stimulation does not, however, necessarily represent intellectual engagement. All learning is not reducible to sound bytes, video clips, and PowerPoint graphics. In fact, too much multimedia stimulation can interfere with the deeper cognitive processing that is critical to learning (Mayer, Griffith, Jurkowitz, & Rothman, 2008). Students who have grown up in this environment have become accustomed to material being reduced to outline form. In part as a consequence of the brevity of online material and communication, students' attention within the classroom may become more limited. The cognitive activity involved in learning and acquiring knowledge, in contrast, often requires sustained attention, intentional effort to synthesize different facts, and an appreciation of the nuances and complexities of the original writings beyond their condensed form.

Individuals, however, too easily equate qualities such as vividness and access on demand with accuracy and validity. Access to information for today's students is both quick and easy but not always quality assured. Students may rely on information from blogs, where the distinction between fact and opinion is often blurred. Without formal editorial oversight, much of the information on the Internet cannot be assumed to be from legitimate scholarly sources. Nevertheless, a substantial and increasing amount of information that forms the basis for students' papers, and their worldviews, comes from unvalidated sources on the Internet. Palfrey and Gasser (2008) addressed this concern. They compared the accuracy of a highly reputable information source (the *Encyclopedia Britannica*) with the accuracy of information available in Wikipedia, the open-source, largely unregulated electronic encyclopedia. They found surprisingly little difference in accuracy between the two sources (Giles, 2005).

So, is technology in the classroom good or bad? It is undoubtedly good in many ways. It is a powerful tool for

overcoming both geographical and temporal barriers to education. It can enhance communication and feedback between instructors and students. Technology also allows students to engage the material and other students in ways that accommodate different social and learning styles. Nevertheless, technology can have negative effects. It can create confusion for teachers as well as students between style and substance, between exposure to information and education, between immediate entertainment and sustained motivation, and between Internet facts and genuine facts. Stimulation may take priority over concentration, and immediate gratification can supplant the cognitive effort needed to transform information into knowledge.

Particularly because of the immediacy, vividness, and on-demand nature of technology in the classroom, satisfaction may be mistaken for achievement. Thus, more than ever, attention needs to be devoted to the scholarship of teaching (Boyer, 1990; Hutchings, 2003; Hutchings & Shulman, 1999) and specifically to how technology inside and outside the classroom affects learning outcomes for new generations of students (see, e.g., Caldwell, 2007; Lewis, Moses, & Silverman, 2005; Tomcho et al., 2008).

Technology and Research

Like education, research has benefited greatly from new technological advances. Entirely new areas of research, such as social neuroscience, have developed in large part because of technological developments in functional magnetic resonance imaging (fMRI) and event-related potential (ERP) equipment. In this section, we again focus on the impact of communication technology and the Internet.

Research in which questionnaires or stimuli are presented and participants respond over the Internet is becoming increasingly common. For example, diary studies, in which people record their responses systematically over a period of days, now rarely use written diaries. Instead, participants may submit their responses online or communicate responses to particular questions using personal digital assistants (PDAs; Bass, Linney, Butler, & Grzywacz, 2007). Internet studies offer a range of benefits. They increase the ease with which longitudinal data can be collected, save money and time (e.g., in the printing and transcribing of questionnaire responses), and reduce errors in transcribing data for analyses. In addition, the Internet increases researchers' access to subject pools beyond first- and second-year college undergraduates and can provide researchers access to populations that are less accessible to conventional contact. For example, researchers have used the Internet to conduct interviews with members of White racist Internet chat rooms, capitalizing on the respondents' anonymity and candor, to study extremist attitudes and advocacy for violence (Glaser, Dixit, & Green, 2002).

Internet research has democratized and globalized research opportunities. The Internet allows researchers located in different countries more opportunity to work together economically and has facilitated international collaborations (Walsh & Maloney, 2002). Commercial software programs that create and disseminate questionnaires (including randomizing the order of questions), that present stimuli supraliminally or subliminally, that measure responses in milliseconds, and that may include videoclips and audioclips are now widely available at a reasonable cost. Moreover, software and equipment that create virtual reality environments, building on common personal computer platforms, are available to researchers on a limited budget. Studies using virtual reality methodologies permit researchers to study activities, such as condom use, that cannot practically or ethically be studied otherwise in real time. In addition, evidence is accumulating that data collected using virtual reality paradigms mirror classic findings in face-to-face laboratory research (Gillath, McCall, Shaver, & Blascovich, 2008). The Internet also permits research on new phenomena, such as computer-mediated communication, as well as addressing old topics, such as large-group behavior or distributed social networks.

The barriers to research that limited many forms of scholarly activity to large graduate institutions are easily overcome with Internet capabilities. Researchers at small colleges are no longer constrained by limited subject pools or restricted laboratory space. Participants can be recruited online through websites that advertise employment opportunities or merchandise or through listservs. International audiences can be reached as economically and easily as those in the surrounding area. Thus Internet research can be based on more diverse samples than those traditionally obtained in university laboratory research (Gosling, Vazire, Srivastava, & John, 2004).

Of course, Internet research has its limitations, and it has been criticized on a number of scientific grounds. Some of these issues continue to be debated. For instance, one criticism is that Internet research may suffer from its own sampling biases, such as involving participants who are more maladjusted, socially isolated, or depressed or who are less motivated and less serious about their research activities. However, Internet users do not generally differ from nonusers on key indices of adjustment and depression, and they can be, with proper incentives, as motivated and serious in their participation as college student respondents and laboratory participants (Gosling et al., 2004; see also Kraut et al., 2003). In addition, criticisms about the validity of Internet procedures have been countered by evidence that responses are psychometrically similar across different response formats (Roberts, 2007). Moreover, in a world in which people spend increasing amounts of time interacting with others over the Internet and immersed in various forms of computer-mediated activity, the experiences in virtual reality research environments may match people's daily, "naturalistic" experiences more closely.

Nevertheless, there are also a number of unique threats to the validity of Internet research that need to be recognized. Although researchers often assume that the anonymity of the Internet reduces evaluation or social desirability concerns, other evidence reveals that Internet participants are as susceptible to evaluation apprehension as are participants using traditional methodologies, and the uniqueness of the experience in research for many Internet participants may actually heighten these concerns. The validity of Internet research may also be compromised by

people motivated by research incentives who participate multiple times or by individuals who fake their credentials (e.g., age) in order to participate and get paid.

In research, as in other domains of primary interest to psychologists, the question about whether new information and communication technologies are good or bad is a complex one. There are many tangible benefits. Ease and economy are two advantages of online research over traditional laboratory paradigms. Online research also typically involves more diverse participant populations than the samples traditionally available in participant pools drawn from introductory psychology courses. Given the significant impact of technology and computer-based socializing (e.g., e-mail, instant messaging, and chat rooms) on psychological experience, important and timely new topics for systematic study are opened up.

However, there are both immediate and long-term consequences that can affect the field in potentially negative ways. Although Internet samples are generally more diverse than college samples, they are still far from representative of the general population. External validity remains a serious problem but one that might more easily be overlooked because "real people" are participants. The ease of presenting materials and recording responses online may continue to move psychology away from its essential focus on human *behavior*. Computer-recorded responses are indeed a form of behavior, but a limited form. Much of human psychology still needs to be understood by observing people's complex perceptual, sensual, and social experiences that operate naturalistically. In addition, Internet research poses new ethical challenges. As with psychological practice, issues of protecting participant privacy in Internet transmission and computer storage are paramount but challenging. Moreover, there may be unforeseen adverse consequences for participants, who may receive adequate debriefing information but without the kind of compassion and responsiveness that can be conveyed face to face. Without being able to monitor participants' reactions, researchers will have difficulty understanding whether participants have been appropriately debriefed. In the long run, public support for psychology requires public trust in the profession.

Technology and Psychological Practice

As with the other areas of technology use that have been discussed, Internet use in psychological practice has both positive and negative aspects. It holds a great deal of promise, but some significant issues need to be addressed, and problems need to be overcome to make it effective and safe.

Telehealth became important in the 1990s, when it was first used to get critical medical services to patients in rural areas by providing access to specialists who could interpret tests, prescribe treatment, and monitor patients who could not get to medical facilities. Teletherapy also became popular in the 1990s. Like telehealth, its goal was to bring services to those in rural areas and to those who, because of age, chronic illness, physical disability, or other limiting circumstances, could not otherwise acquire such services. Teletherapy was born of necessity, not convenience, and was not originally considered an alternative to face-to-face therapy sessions.

With changing technology and patients' strong motivation for immediate gratification, online therapy is now more of a demand. One area of Internet use that has significant applications for psychologists is online therapeutic interactions (Rudestam, Giannetti, & Stamm, 2003). There are two types of online practice considerations: (a) those that are clinician mediated and (b) those that are nonmediated, such as online self-help programs and support groups. Although both hold promise, both also have important potential limitations.

With respect to clinician-mediated online therapy, practitioners frequently express concern about the lack of information received from clients in terms of body language and other nonverbal cues. Psychologists are trained to use not only verbal cues but also body language and paraverbal cues to fill in the clinical picture when diagnosing and treating patients. In addition, it is difficult to sense emotion when doing online therapy without visual contact. Even with the advent of webcams and Skype, video transmissions are limited, and these cues often cannot be clearly seen. Many patients do not own these technologies, nor are they willing to invest in them, which further restricts clinician information. Therefore, the clinician may have difficulty acquiring not only diagnostic information but also enough feedback to establish a sense of trust with the patient, which is essential to successful psychotherapy.

Online therapy poses a number of other problems for clinicians, such as insurance and jurisdictional issues. Most insurance companies (third-party payers) do not pay for non-face-to-face therapy, often not even covering telephone therapy sessions with a regular patient who cannot get to the clinician's office for legitimate reasons. The jurisdictional problems can also be significant. One main advantage of the Internet is that geographical boundaries are not a communication obstacle. However, this advantage raises knotty problems when the client moves to a state in which the therapist is not licensed or contacts the clinician online and does not reveal his or her state of residence. Licensing is a state issue, and there is little reciprocity between states. Conducting therapy across state lines, even inadvertently, may result in charges against the therapist for practicing without a license.

Because many patients use e-mail and other Internet modalities extensively, psychologists can expect to receive a larger number of communications. This type of communication raises a number of ethical and practical issues for the clinician, such as the duty to warn clients of potential breaches of confidentiality and the possibility that a message will not be received by the therapist in a timely manner, which rules out online therapy's use for emergency interventions. The message also may not be received at all, resulting in a possible breach of confidentiality if it goes elsewhere. Clinicians may also be expected to respond to patients' questions that arise from exploring online in-

formation on almost any topic possible, including topics relating to mental illness.

Online therapeutic sessions that are not clinician mediated are becoming more popular and accessible over the Internet. Popular psychology sites (e.g., about the "inner child") and Web-based treatment for depression are among available modalities. Nevertheless, the effectiveness of these sites has been the subject of only limited study. Although an online program for treating depression was found to be effective as a tool, this was only true for persons who completed the treatment protocol (Stamm, 1998, 2000). Online support groups have shown some benefits in other domains. For instance, cancer patients who participate in online support groups perceive more social support, experience less loneliness, and cope more effectively with their disease than do cancer patients who do not participate online (Klemm, Bunnell, Cullen, Soneji, & Holecek, 2003). Nevertheless, Internet support groups for psychological problems, such as depression, warrant continued research in terms of their direct impact and their effectiveness as a supplement to face-to-face care.

One of the most fundamental challenges in the use of technology in psychological practice relates to issues of privacy and confidentiality. Therapists and clients often share concerns about the lack of privacy and about accidental or malicious disclosure.

Among other unintended consequences, however, is that technological advances have put patient rights, especially their privacy rights, in jeopardy. Over the years, systems have been developed to make it possible to share medical histories and data electronically, which has led to the ability to diagnose and treat more rapidly, efficiently, and effectively with fewer errors. Once insurance coverage for psychological treatment became the model, information of an extremely personal nature was required in order for the clinician to be paid. Even though this information is typically encrypted, there are still concerns that some of these data might be susceptible to exposure. There is little a clinician can do to protect a patient's privacy once the information is sent.

The Health Insurance Portability and Accountability Act (HIPAA), which was designed to protect the public in electronic health data transmission, has made people aware of these security and privacy issues and has created rules and guidelines for practitioners who file insurance electronically. However, HIPAA is written as a one-size-fits-all model; it lumps together the small laptop-owning psychologist with complex hospital management information systems in a maze of regulations hard to wade through, let alone understand and implement. With respect to privacy issues, the APA Practice Directorate has worked diligently for legislative change and to provide materials for practitioners to guide them in their struggle to figure out the HIPAA requirements and comply with them. The challenge for APA is to continue working with government entities to further ensure patient privacy and practitioner security in cost-effective ways for practitioners.

Overall, technological advances open new opportunities in almost every facet of psychological practice, including diagnosis, delivery of treatment, and office operations. A range of new handheld wireless devices make a number of activities, such as setting appointments and answering questions, easier and more efficient. However, as Collins (2007) warned, "Nothing that enters cyberspace is ever completely secure" (p. 690). Moreover, wireless communications sent by PDAs or other devices are particularly susceptible to violations of privacy.

Nevertheless, technology use also poses new challenges to the profession. In terms of treatment, it is difficult for researchers to evaluate the effectiveness and perhaps unintended consequences of the various online interventions used by clinicians and counselors, as well as the rapidly emerging different self-help sites available on the Internet. A further challenge is to get psychotherapists recognized as an integral medical specialty, which would allow them to work with physicians and directly input information in medical records.

The pace of change in technology, which has immediate advantages, also typically involves unanticipated new problems. In addition, as technology continues to develop and as consumer demand increases, there will be new challenges to both our Ethical Standards and our Practice Standards, challenges that will need to be addressed in a timely manner.

Technology and an Evolving APA

Most organizations, especially large member-serving organizations, are joining the digital revolution in an effort to reach their constituents more efficiently and more cost-effectively. Within APA, technology offers new ways to conduct Association business while limiting expenses, to disseminate knowledge, and to reach new markets for Association products. APA has been an industry leader in technology, particularly with respect to aspects of electronic publishing. It took the initiative in digitizing its abstract database and in providing members access to articles electronically. APA has long recognized the central value of a website for communicating both with members and the general public and has reaffirmed its commitment to digital communication with its substantial recent investment in a new website.

However, as APA immerses itself more fully in technology in ways that permeate all functions of the organization, it is important that it consider the organization's core needs and values, as well as its traditionally valued avenues of communication. As we noted earlier, technology has a profound influence on social interaction and personal orientations. Thus, technology designed to address particular organizational needs or solve specific problems can have broad, often unintended, organizational consequences. We suggest that without sufficient reflection, using technology to address immediate challenges can have long-term effects that will shape the evolution of APA's future. We illustrate this point with respect to two main activities of APA, serving its members and disseminating psychological knowledge.

Technology and Member Needs

Three of the most fundamental activities among APA members have been voting for APA president, participating in governance, and attending a vibrant annual convention. These activities illustrate both the benefits and the potential costs of technology for the Association.

With respect to voting, technology has the potential to enhance members' connection to the Association. APA used electronic voting for the first time in its Fall 2008 presidential election. The result was a further increase in the percentage of members voting in the election, from 15.2% and 19.3% in the two previous elections for APA president to 20.9%. Thus, an immediate effect of technology has been to increase the membership's involvement in selecting APA leaders. In addition, the APA Council of Representatives implemented electronic voting at its February 2009 meeting.

Whereas voting involves discrete action, governance processes and convention participation have substantial social components that are difficult to simulate technologically. In both of these activities, direct interaction among members, especially networking, has been a core activity. The benefits and costs of technology in this area are thus more difficult to assess.

With respect to governance activities, technology can be used to expedite the work of task forces and other groups, such as committees and boards. Expenses for meeting space, travel, and lodging can be trimmed substantially by substituting virtual meetings for face-to-face ones. Some have speculated that this technology could even be used for Council of Representatives meetings. During financially difficult times especially, there is a significant upside to virtual meetings.

There may be a substantial downside, too. Participation in governance has long been among the most meaningful experiences for members, socially as well as professionally. These direct and personal interactions may be particularly valuable for establishing cooperative relations among representatives of diverse constituencies within the organization. Researchers have found that the most effective use of the Internet in task groups was for sharing information that was not time sensitive. In addition, limited communication leads people to rely more on their different group identities than on more individuated impressions or a sense of common identity and thus produces less trusting and less trustworthy behaviors (Gaertner et al., 1999; Insko et al., 2001). Moreover, the demands on staff and the expense associated with coordinating virtual meetings may substantially offset the apparent savings on travel.

The APA Convention is a major annual event for members. Convention programs convey cutting-edge information, provide educational and training information, and offer opportunities for professional networking and for reconnecting with others socially. However, information can now be disseminated more rapidly and efficiently electronically than through a once-a-year meeting. Online instruction is widely available and is available year round. Are the face-to-face professional and social aspects sufficient to maintain the annual convention as a centerpiece of the organization?

In addition, further developments that appear to have immediate benefits for members might ultimately undermine the convention in the future. For example, it may be possible to teleconference some sessions at a per session charge to those who cannot attend. In addition, the Association should expand the number of online courses using the Internet and technology for continuing education credits. This technology helps APA members more easily meet many of their state requirements for certification and licensure and also presents APA with a revenue stream that could be considerable, especially if other professional associations would allow their members to participate in this activity. Nevertheless, expanding continuing education online could mean competition with the programs presented at the convention, reducing the incentive for members to attend the conference.

Technology and Knowledge Dissemination

As we noted, APA has been a leader in technology and in disseminating scholarly knowledge. APA publishes numerous journals and books, which represent the largest revenue stream (journals and books sales and licensing) for the Association, over five times greater than the revenue from membership dues. Nevertheless, new developments in publishing, stimulated by technological advances, pose new challenges to APA.

Open access represents the most significant of these challenges to the Association. *Open access* is defined by Wikipedia (which is available for free online and is now the world's largest and most frequently consulted encyclopedia, with 2,500,000 articles) as "free, immediate, permanent, full-text, online access for any user, web-wide, to digital scientific and scholarly material," primarily research articles published in peer-reviewed journals. Open access allows individual Internet users to link, read, download, store, print, and use the digital content of the article. Approximately 10%–15% of the peer-reviewed journals across all disciplines and countries are now open access journals.

Open access represents an important dilemma for APA, and it has provoked enormous debate within the Association. On the one hand, the overwhelming majority of psychologists endorse public dissemination and access to scholarship, and enhanced access to research publications improves the public's understanding of psychological science. On the other hand, free access seriously threatens APA's single largest revenue producer.

Open access also raises equity issues. For example, the public would have free access to information, whereas researchers would have heavy up-front costs for publishing their research. Many scientists will be unable to afford the hefty fees charged to archive the articles or the processing/publication fees charged by some open access journals (DeAngelis, 2004). Also, when journal articles go "virtual," they certainly reach more people around the world,

but their use and potential misuse are more difficult to control. Author credit, correct attribution, and contextual accuracy are rarely respected when documents are located online, infringements that are similar to the rampant piracy of music found online. Open access thus creates new challenges for APA, raising questions about how the organization can best serve the public, the profession, and its members.

Technology may thus spur APA to consider new ways of communicating broadly to the public. APA is currently redesigning its website to provide resources for both members and the public. While most agree that providing extensive and timely information to the public is a part of APA's mission, a website simultaneously serving both professionals and the public may inadvertently alter members' perceptions of the special benefits they receive from the Association. As APA continues to redesign the website, it will face the challenge of determining the type of information to disseminate to its members and to other interested parties.

In a universe in which APA's efforts to disseminate knowledge will be competing with waves of unvalidated information, APA may have to consider outlets beyond professional journals and the APA Web page. It may need to consider nontraditional outlets, such as YouTube. It may also need to rely more on cross-referencing between popular terms, such as "helicopter parents" and "millenials," and the corresponding scholarly concepts behind them to facilitate the dissemination of information to lay audiences and the media.

If APA broadens its knowledge-dissemination efforts to place more emphasis on popular outlets, this may have other unintended consequences for members. Demographically, APA is an aging organization. Some believe that technology may divide generations, which would affect the APA membership. A concern is that older members may have more difficulty adapting to the new technologies, such as text messaging, or may be unfamiliar with some of the newer social utilities. However, assuming that they cannot adapt is a form of ageism. The problem may therefore be framed as one of instruction rather than ability. Thus, APA might invest in creating online continuing education courses or distributable DVDs that could assist members in addressing the gaps in their technological knowledge. As APA competes technologically with other sources of psychological knowledge, it will need to consider ways of preventing substantial, valuable portions of the membership from becoming disenfranchised.

As these few examples of member activities and knowledge dissemination illustrate, the challenge for APA is not in adopting new technology—that is a necessity and an inevitability—but rather in understanding the cascading consequences, long term as well as short term, that will impact the essential functions of the organization.

Conclusion and Recommendations

The introduction of a new technology into widespread use is generally accompanied by apocalyptic predictions of the demise of cherished elements of society. At times, these doleful prognostications have some accuracy: The introduction of the automobile led to accurate predictions of unemployment in the sutler's trade. Generally, though, such fears are overblown. In the previous sections, we have tried to strike a balance between acknowledging the impressive benefits of emerging information and communication technologies and expressing caution about potential negative consequences.

There is ample evidence that technology is changing the ways that people interact and learn. Technology has changed the way psychologists conduct their research and their practice. We note, however, that dramatic changes in human behavior rarely follow immediately from the introduction of new technologies. New technologies rarely cause the syntheses that futurists and others so ardently hope for. At the same time, they are not the harbingers of doom that others fear. Although generations adopt technology at different rates and to different degrees, the impact of technology permeates society as a whole, often in ways that are unintended and unanticipated. Although the immediate impact of technology is often visible in discrete activities, the real transformative power of technology is more diffuse and difficult to recognize (Brown & Duguid, 2000). This article is intended to alert APA and its members to the pervasive and multifaceted influence of technology on our profession.

As our title indicates, technology changes everything, and nothing, in psychology. Technology, especially communications technology, exerts a profound influence on human interaction, education, and psychological research and practice. It is critical to the current functioning of APA, for communicating with members, and for disseminating knowledge to the general public and policymakers. Technology changes everything. At the same time, although the nature of the Internet and the rapidly emerging new communication technology is unique and unprecedented in many ways, technological innovation has been an integral aspect of human experience, interaction, education, as well as psychological research and practice, across our lifetimes. Technological change has been a fundamental aspect of human existence from our earliest evolutionary beginnings, and adaptability, individually and socially, is a defining characteristic of the human species. And so, technology changes nothing.

The nature of human interaction constantly changes across time and generations, and it will continue to do so. Educators have consistently adopted new ways to convey information and engage students as well as to adjust to students' evolving attitudes, aptitudes, and experiences. Psychologists have regularly adopted new technologies to facilitate research and practice. Moreover, even while methods of communication, education, research, and practice change, some things do not: Psychologists will still adhere to basic principles of good and fair research, practice, and teaching. With these principles in mind, the Policy and Planning Board offers the following recommendations to assist APA and psychologists in meeting the challenges posed and exploiting the opportunities provided by new technology.

The first three recommendations reflect both our concern about the power of new technologies to increase social divides and our recognition of their enormous potential to create more immediate and stronger connections between the society and its members and the public. The next two involve APA's role in ensuring the quality of psychological information available to students, professionals, and the public. The last three recommendations identify key areas for APA initiatives and for continuing education of APA members, researchers as well as practitioners.

Recommendations

1. APA should find new ways to integrate traditional communications and new technologies to promote more member involvement in the Association.
2. APA should maintain communications with psychologists and the public regardless of the targeted audiences' computer literacy.
3. APA should support research on and disseminate information about both the "socioeconomic divide" and the "generational divide" regarding access to electronically mediated materials.
4. APA should explore new mechanisms that will assist professionals in evaluating the validity of psychological information disseminated online by other groups.
5. APA should monitor developments in open access and consider new publication initiatives that enhance access to psychological knowledge while maintaining the health of publications as a major revenue source for the Association.
6. APA should strive to be one of the groups at the forefront of providing lifelong learning opportunities using technology (podcasts, webinars, real-time screening) for its members, other mental health and health professionals, and the public, where warranted.
7. APA should create and disseminate more educational messages regarding electronic issues such as legal liability and new requirements in both research and practice.
8. In view of the jurisdictional and insurance issues involved in Internet practice, APA should be involved in working toward national licensure for practitioners.

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