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The Capstone thesis/project for the master's degree submitted by the student listed (above) under this title *

The Impact of Technology on Psychology: An Integrative Literature Review

has been read by the undersigned. It is hereby recommended for acceptance by the faculty with credit to the amount of 3 semester hours.

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<td>Shaneika A. Dilka, PhD</td>
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The Impact of Technology on Psychology:
An Integrative Literature Review
Submitted to the Faculty
Of
American Public University
By
Todrick Body
In Partial Fulfillment of the
Requirements for the Degree
Of
Master of Arts
January 2017
American Public University
Charles Town, WV
DEDICATION

I dedicate this thesis to my wife, son, and naptime. Without her caring, strength, and patience this would not have been possible. Without my son’s naptime I would not have been able to maintain the focus that this work required.
ACKNOWLEDGMENTS

I wish to thank the students and faculty of American Public University. Each of my professor’s has left me with a deeper appreciation for the field of psychology and the almost sacred bond that occurs between a teacher and student. My interactions with my classmates have expanded my understanding and passion for this complex, fascinating field in ways that I will continue to cherish. I would like to express my sincere gratitude to Dr. Shaneika Dilka for the support of my master’s degree study and related research, for her care, encouragement, and immense knowledge. Her guidance helped me in all the time of research and writing of this thesis. I could not have imagined having a better mentor for this final stage of the program.
ABSTRACT OF THE INTEGRATIVE LITERATURE REVIEW

The Impact of Technology on Psychology: An Integrative Literature Review

By

Todrick Body

American Public University System, January 5, 2017

Charles Town, West Virginia

Dr. Shaneika Dilka, Psychology Professor

Recent technological advances involving the use of the Internet and complex communication devices have significantly impacted the provision of psychotherapy and other mental health services as well as how the training of educators and clinicians may be conducted. Technology can provide greater access to needed services such as training, treatment, and consultations. The prevalence of mental health professionals that are using social media and emerging technologies to engage with clients, conduct research, and interact with other professionals has led to unique opportunities as well as previously unforeseen challenges for today’s mental health practitioners. This paper reviews literature that is relevant to the use of technology in four major areas of psychological field which are contemporary issues, ethics, physiology, and learning/cognition. These studies highlighted the positive outcomes of the increased use of technology and the limitations specific to technology-related mental health interventions. Findings suggest that the unavoidable incorporation of new forms of technology
may provide a long list of positive breakthroughs in the future, but they might also lead to a myriad of challenging ethical and legal issues if they are not fully understood in the present.
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevance</td>
<td>1</td>
</tr>
<tr>
<td>Literature Review</td>
<td>3</td>
</tr>
<tr>
<td>Methodology</td>
<td>3</td>
</tr>
<tr>
<td>Ethics</td>
<td>4</td>
</tr>
<tr>
<td>Critical Incidents</td>
<td>4</td>
</tr>
<tr>
<td>Electronic Patient Communications</td>
<td>6</td>
</tr>
<tr>
<td>Social Networking and Professional Ethics</td>
<td>7</td>
</tr>
<tr>
<td>Social Networks and Self-Disclosures</td>
<td>10</td>
</tr>
<tr>
<td>Technology and Independent Practice</td>
<td>11</td>
</tr>
<tr>
<td>Smartphone Applications and Suicide Prevention</td>
<td>12</td>
</tr>
<tr>
<td>Contemporary Issues</td>
<td>13</td>
</tr>
<tr>
<td>Computerized Behavior Therapy</td>
<td>14</td>
</tr>
<tr>
<td>Social Media and Sobriety Recovery</td>
<td>17</td>
</tr>
<tr>
<td>Social Media Recruitment and Data Collection</td>
<td>19</td>
</tr>
<tr>
<td>Media Influences and Self-Stigmas</td>
<td>20</td>
</tr>
<tr>
<td>Social Media Use in Rural Areas and Telepsychology</td>
<td>22</td>
</tr>
<tr>
<td>Physiological Psychology</td>
<td>23</td>
</tr>
<tr>
<td>Neuroscience and Neurological Imagery</td>
<td>23</td>
</tr>
<tr>
<td>The Neurobiology of PTSD</td>
<td>24</td>
</tr>
<tr>
<td>Behavioral Treatments for Gambling</td>
<td>26</td>
</tr>
<tr>
<td>The Neuroscience of Play Therapy</td>
<td>27</td>
</tr>
<tr>
<td>Predications and Neuroimages</td>
<td>28</td>
</tr>
<tr>
<td>Learning and Cognition</td>
<td>29</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Electronic Portfolios and Self-Regulated Learning</td>
<td>29</td>
</tr>
<tr>
<td>Web-Based Interventions For Teachers</td>
<td>29</td>
</tr>
<tr>
<td>Textbook Technology Supplements and Virtual Humans</td>
<td>30</td>
</tr>
<tr>
<td>Adaptive Learning Technologies</td>
<td>31</td>
</tr>
<tr>
<td>Discussion</td>
<td>32</td>
</tr>
<tr>
<td>Conclusion</td>
<td>35</td>
</tr>
<tr>
<td>References</td>
<td>37</td>
</tr>
</tbody>
</table>
The Impact of Technology on Psychology: An Integrative Literature Review

Over the past decade, a significant amount of attention has been given to the potential role of new forms of technology in the practice of psychology. The use of progressively sophisticated types of technology in the form of emails, video conferences, online chats, and the Internet has become the focus of an increasingly large volume of psychological literature. A large portion of the growing body of literature has provided a view into many of the clinical, legal, and ethical issues that will be discussed throughout this review. Many of these technological advancements are capable of improving access to training, consultation, and supervision opportunities. On the other hand, when misused or when inadequate forethought is taken, there are negative consequences that can easily affect a wide range of outcomes. This review was designed to expand upon the previous literature by discussing significant events, across multiple studies, in order to highlight the changes that have occurred and will occur due to recent technological advances in the field of psychology. Although the influence of the rapid evolution of technology can be felt across numerous scientific fields, there are very few studies that have managed to provide a clear picture of its current and future impact on the field of psychology.

Relevance

The use of certain communication technologies can provide treatment services to clients in rural areas, enhance communication between a client and a therapist, and provide educators with unique training opportunities (Grant & Dill-Shackleford, 2016). These types of technology are referred to as “telehealth”, “eHealth”, and “telepsychology”. Social media platforms include web-based and mobile-based Internet technologies that allow users to engage in interactive dialogues between individuals and organizations (Elhai & Hall, 2015). These categories of far-
reaching services are gaining popularity and increased attention among mental health professionals, as a growing amount of literature continues to shine a positive light on the use of psychology-related technological innovations.

One of the primary reasons why telehealth and computer-based interactive technologies have increased in popularity revolves around the challenges that are commonly associated with the current system of treatment (Bickel, Burkhalter, Marsch, & Badger, 2008). Issues involving inadequate funding, insufficient treatment options, and long-lasting social stigmas have led to the increased application of computer-based technologies (Bickel et al., 2008). Other forms of treatment modalities include email, instant and telephone messaging, and videoconferencing (Elhai & Hall, 2005). Despite the growing number of technology savvy professionals that will rely on many of these emerging advances, there is surprisingly little guidance concerning the appropriate use of these tools by many of the large psychological organizations (Elhai & Hall, 2005).

As technology continues to alter society’s everyday behavior, it will become critically important to gain a better understanding of the role that it will play in scientific fields such as psychology. Technology has been shown to permeate the core areas of contemporary issues, ethics, learning and cognition, and physiological psychology in profound ways. Each individual area of the complex field of psychology has witnessed a rapid change that has been fueled by advanced technology and a more in-depth understanding of many mental health disorders. In a similar fashion to many of the rapid cultural and ethnic changes that outpaced the regulations of the past, the field of psychology will be forced to “catch-up” to the inevitable technological revolution that is occurring, which could leave clinicians and clients in a potentially harmful or dangerous position. The following literature review will discuss the ways in which technology
has shaped, hindered, or significantly improved topics that are related to the four areas of contemporary issues, learning and cognition, ethics, and physiological psychology. The review will thoroughly discuss 24 studies and synthesize their collected data in order to highlight the important role that technology has played and will continue to play in the field of psychology.

**Literature Review**

**Methodology**

Preliminary searches revealed an abundance of research that focused on the general use of specific types of technology in a range of psychological experiments. The integrative approach was chosen because it allowed for the synthesis of relevant experimental information to create a well-defined portrayal of the overall theme of the review.

I targeted studies that involved psychological concepts that could be combined with the use of technology, online journal databases, PsycINFO, PsycARTICLES, EBSCOhost, and Academic Search Premiere. The studies were also selected based on whether or not their data covered significant and current literature from the year of 2006 to December 2016. The articles were searched using the following keywords: *technology, psychology, mobile applications, social networking, social media, ethics, education, learning, telehealth, contemporary issues, and computer-aided learning*. The research targeted titles, abstracts, and keywords using the terms in multiple combinations. The initial searches revealed a total of over 60 studies. The duplicates were removed along with any false positives and the remaining literature was reviewed using the project’s previously designated standards. Twenty-four peer-reviewed studies were chosen for inclusion. Articles that involved multiple studies that did not prove to be peer-reviewed while failing to clearly relate to the overall theme of the review were excluded from the paper as well.
The sources that were gathered were initially classified by subject and placed into subgroups based on their relationship to one of the four main topics of the review. The data was analyzed, extracted, and reviewed according the project guidelines. Conclusions were then synthesized, integrating the sources into a comprehensive portrayal of the realistic role that technology will continue to play in the field of psychology.

Ethics

Critical incidents.

The integration of various forms of technology into clinical services can increase access to needed treatments for groups of individuals that live in remote areas and expand the reach of psychological services to larger portions of today’s diverse population. While this improvement brings many potential positives to both clients and psychologists, the integration of advanced forms of technology into the field of psychology has also created a large number of ethical, legal, and cultural challenges over the past decade. These challenges were discussed and highlighted throughout several of the studies that were focused on understanding today’s mental health professionals’ concerns surrounding confidentiality, clinical/technological competence, and data safeguards. The integration of technology into the professional practice and training that is associated with the mental health fields has also led to a major transformation of the various ways in which psychological research has been conducted.

The Internet has become a tool that can be used to collect information about participants via survey research, qualitative research, and descriptive research while also acting as an intervention tool with nearly limitless possibilities. Many of the ethical guidelines that serve as the moral foundation for the field of psychology, place the ethical responsibility for protecting client data with practitioners (Allen & Roberts, 2011). While advancements such as electronic
medical records, email communication, and telemental health programs have proven to be largely beneficial due to increased efficiency and their ability to facilitate communication, there are also several disadvantages that are associated with the increased reliance upon certain forms of technology (Allen & Roberts, 2011).

In 2011, Jason Allen and Michael Roberts, from the University of Kansas, recognized several of the advantages and disadvantages of the increased use of technology. Previous studies have indicated that the difficulties that are involved with database management, communication security, disclosures of personal information, and unethical social media interactions have also been associated with the increased use of technology in psychological services (Allen & Roberts, 2011). Through the use of a specifically designed survey, the authors raised several important ethical questions in an effort to foster future discussions among psychological professionals and to evolve a better-rounded, technologically-inclusive Ethics Code (Allen & Roberts, 2011).

The authors recruited 28 participants from the listservs of several state psychological associations. Critical Incident Techniques (CITs) were used to conduct surveys and subsequent response-evaluations (Allen & Roberts, 2011). The survey questions appeared to be overly broad and the psychologists were asked to describe their experiences using open-ended questions which may have limited the conclusions that were drawn later in the study (Allen & Roberts, 2011). The study indicated that the most common concerns of the respondents involved client data that was compromised, inappropriate communication practices, and unplanned complications involving the use of social networking websites (Allen & Roberts, 2011). The study separated each response into an individual category which helped to provide a clear view of the ethical considerations that are have proven to be the most challenging to many of today’s professionals. The data showed that there was a clear lack of understanding involved with the use
of electronic records, email, and social networking account security (Allen & Roberts, 2011). The brevity of the study also fostered several very apparent limitations. The authors failed to gather information that involved each participant’s professional setting or base rate for the various ethical concerns (Allen & Roberts, 2011). Despite the minor shortcomings, a significant finding of the study involved the current APA’s ethical guidelines. There is a clear need for psychology’s governing body to provide clear and well-defined standards involving the use of certain Internet platforms (Allen & Roberts, 2011).

As mental health professionals continue to embrace the use of popular technology modalities such as email, instant messaging, and videoconferencing, it will become increasingly important to understand the way in which the use of these tools may lead to difficult situations. In a similar fashion to this study, the following study will discuss the security of electronic patient communications along with any potential ethical implications that might be associated with concerns.

**Electronic patient communications.**

The past decade has proven to be one of technological growth and the increasing vulnerability of personal privacy (Elhai & Hall, 2015). The landscape for data protection continues to rapidly change, which requires an increased volume of ethical reviews and training (Elhai & Hall, 2015). As electronic communications become more common, there is a risk of compromising client confidentiality and breaking a privileged bond that has shaped the therapeutic process (Elhai & Hall, 2015). Similar to the previously discussed study, Jon Elhai & Brian Hall (2015) recognized the potential ethical challenges that are on the horizon and designed an empirical investigation to learn more about it. In an attempt to gain a mainstream representation of the modern day clinician, the two authors recruited 141 members of a major
cognitive behavioral psychotherapy association (Elhai & Hall, 2015). The study indicated that the participants were well-connected digital users, with an average of 7.5 years of experience after the attainment of their highest degree (Elhai & Hall, 2015). Surprisingly, the older participants engaged in the use of electronic communications at a significantly higher frequency than the younger participants (Elhai & Hall, 2015). Although a minority of the respondents reported previous security breaches, several of the clinicians reported a lack of encryption in their email use, a lack of password protection, and a failure to mask private cellphone numbers with clients (Elhai & Hall, 2015). The implications of a tech-savvy field of professionals that are either unaware or incapable of recognizing certain security vulnerabilities could be dire.

The study’s small number of limitations included a lack of a generalized sample of treatment providers and an over-reliance on self-reports instead of a collection of data about each participant’s digital device usage (Elhai & Allen, 2015). This cautionary study showed that the use of electronic devices and communication tools that are familiar to clinicians may have created new ethical obstacles that the current codes of ethics may not have fully addressed.

While there are ethical concerns that should be addressed in the area of information security, there are also issues that should be addressed in the area of social networking behavior. The next study will focus on a form of communication that has connected millions of people around the world, social networks.

**Social networking and professional ethics.**

While social networking sites such as Twitter, Facebook, and LinkedIn are used to connect people with similar interests, share information, build professional networks, and foster romantic relationships, they can also be used by mental health professionals to reach their clients and peers in many progressively sophisticated ways (Harris & Kurpius, 2014). As popular sites
such as Facebook continue to surpass what was once thought to be impossible by connecting over 500 million users, and the number of overall users continues to rise, online memberships are becoming cultural norms that require attention and research (Harris & Kurpius, 2014). Previous studies have also shown that as high as 81% of the APA’s student members had a social networking account (Harris & Kurpius, 2014). The authors suggested, that despite the abundant use of social networks among certain age groups, the relative newness of the tools might result in an inadequate form of supervision by supervisors and faculty members that was unable to provide any of the much needed advice involving ethics and the use of the sites (Harris & Kurpius, 2014).

In response to the ethical dilemmas involving privacy, confidentiality, and informed consent that have flowed from the use of social networks, Sara Harris & Sharon Kurpius (2014) examined the use of online client searches by 315 counseling and psychology graduate students. Following several emails to the liaisons of the Council of Counseling and Related Educational Programs (CACREP), 77.5% of the students completed a specially designed online questionnaire (Harris & Kurpius, 2014). This study provided critical data through its careful examination of the online behaviors of future mental health professionals and the practice of using social networks to collection information about clients. The study succeeded in generating a hierarchal regression model for online client searches, informed consent best practices, and disclosures (Harris & Kurpius, 2014). The authors hypothesized that the experience with social networking, lower scores on the ethical-decision making surveys, and enrollments in school counseling programs would all have a visible effect on the use of online searches of client information (Harris & Kurpius, 2014).
Out of the 98.6% of participants that stated that they had social media accounts, 79.7% indicated that they checked their accounts on a daily basis (Harris & Kurpius, 2014). The rate at which the social media accounts were checked proved to be important because of the role it played in each respondent’s eventual use of social networks on a personal and professional level. A 6-point Likert-type scale was used to measure the frequency of online client searches while a short ethical decision-making subscale was used to create an ethical baseline (Harris & Kurpius, 2014). Out the 226 consistent social site users, 75 (33.2%) used the Internet to search for client information (Harris & Kurpius, 2014). The use of online searches of client data can lead to a large number of highly unethical situations. Although unintentional, a surprisingly small number of participants engaged in a very dangerous, unethical practice that may have compromised the inherent rights of their clients. The ethical guidelines proved to be incapable of providing a clear path through the ethically ambiguous fog of Internet use in a clinical setting.

The study also stated that 29.2% of the client data searches occurred through the use of Internet search engines such as Google (Harris & Kurpius, 2014). A large majority of the Internet search users failed to discuss any potential breaches of confidentiality with their clients, failed to obtain informed consent prior to the searches, and failed to document the online searches in the client’s files (Harris & Kurpius, 2014). The visible link between the use of the online searches, the number of years in a graduate program, and lower scores on the ethical decision-making subscales should also create a realistic level of caution (Harris & Kurpius, 2014). The limitations of small effect sizes, over-relying on self-report, and the use of online surveys were identified by the authors (Harris & Kurpius, 2014). Unlike the other studies, this study focused on the next generation of professionals and their beliefs surrounding potentially unethical practices. This study managed to briefly discuss the use of social networks. The next
study will expand upon the social networks topic and provide a valuable insight into another potential ethical battleground.

Social networks and self-disclosures.

Many psychologists are involved with web sites that describe their occupational specialties and services (Taylor, McMinn, Bufferd, & Chang, 2010). According to the previous study, an increasing number of therapists are allowing clients to contact them via email, and an even smaller number of psychologists have started to use the Internet to conduct therapy (Harris & Kurpius, 2014). Due to the risks to confidentiality, the use of technology has magnified the need to acquire informed consent before a client participates in any online activities that are related to their private information and therapy. Popular sites such as YouTube, Facebook, Twitter, and Friendster can provide clients with the ability to access the personal information of their psychologists which can still be considered very taboo (Taylor et al, 2010). A group of researchers from George Fox University sought to discover the various ways that psychologists use social networks in their professional and private lives. It quickly became clear that surveys and questionnaires were the most popular methods of gauging the ethical practices of therapists.

This study also relied upon online questionnaires that the authors sent to 695 doctoral-level students and licensed psychologists (Taylor et al, 2010). In a similar fashion to the previous studies, a specially designed questionnaire that was intended to gather information about each participant’s use of social networks (Taylor et al, 2010). The data showed that 77% of the respondents maintained a social network account (Taylor et al, 2010). The respondents acknowledged a reasonable level of uncertainty due to the visible need for clear guidelines for the management of technological advancements and the difficultly surrounding any attempts to keep up with the rapid and ubiquitous technological changes (Taylor et al, 2010). The study
suffered from a very small number of limitations which included the preponderance of graduate
students as compared with the minimal number of psychologists, the exclusive use of an
electronic delivery system, and several very short surveys which could have affected the data in
different ways (Taylor et al, 2010). The study succeeded in providing an important insight into a
subject that could be used to inspire future researchers and spark professional conversations. It
was easy to recognize the data that related to the uncertainty that the previous studies
highlighted. Once again, this study showed the importance of a clear set of parameters involving
the use of the Internet in any psychological setting. The next study involved a more professional-
centric analysis than this study, which should provide a better-rounded picture of the ethical
challenges that technology has wrought upon the psychological field.

Technology and independent practice.

Several other researchers from George Fox University recognized the challenges that
have grown from the accelerated pace of change within the field of psychology and decided to
follow-up on an in-depth study that also utilized a survey to explore the technology-related,
ethical/unethical behaviors of today’s mental health professionals (McMinn, Bearse, Heyne,
Smithberger, & Erb, 2011). Following a thorough discussion of the efforts of the APA’s Ethics
Committee, the study identified the 286 independent practitioners that completed the lengthy
questionnaire. Unlike the previously discussed studies, this study provided data that indicated a
small amount of ethical caution by the respondents (McMinn et al, 2011). The survey responses
showed that almost none of the respondents chose to provide clinical services, supervision, or
therapeutic consultations via social networking sites, which significantly contrasted the actions
of the students and professionals that this review previously discussed (McMinn et al, 2011).
The study also revealed a large number of ambiguous responses to ethical scenarios which
furthered the need for the future clarification of certain ethical issues. Each participant was asked to provide an opinion rather than having their behavior observed which may have led to an identification of activities that differed from actual practice (McMinn et al., 2011). The next and final study will involve a combination of technology and psychology that could represent the future in suicide preventions.

**Smartphone applications and suicide prevention.**

Suicide has become the leading cause of death globally, and many professionals are turning to a tool that is capable of reaching a large segment of the population that is affected by the crisis, young people (Larsen, Nicholas, & Christensen, 2016). The authors recognized the popularity of cell phones and the positive potential of health applications (apps) for the improved access to a low-cost, convenient suicide intervention technique (Larson, Nicholas, & Christensen, 2016). Although there is a high level of enthusiasm surrounding the use of mobile phone apps that provide mental health services, there is also a lack of concrete data related to suicide prevention/response apps which led the team of researchers to investigate (Larson, Nicholas, & Christensen, 2016). The availability of easily accessible apps that are involved with such an important situation raised several important ethical questions about the current and future adoption of this type of technology. The study compared the evidence-based strategies with the content of publically available apps that were mostly independent of professional guidance (Larson, Nicholas, Christensen, 2016).

The researchers studied one hundred and twenty-three apps and conducted a systematic review to analyze each app’s content (Larsen, Nicholas, & Christensen, 2016). Most of the apps encouraged the obtainment of family support and safety planning while all of the apps contained at least one guideline that was similar to the World Health Organization’s best practice for
suicide prevention (Larsen, Nicholas, & Christensen, 2016). Half of the apps relied upon the
input from a professional organization which highlighted the danger of such abundant and yet
non-research grounded apps (Larsen, Nicholas, & Christensen, 2016). Several apps were also
shown to contain dangerous and potentially harmful information (Larsen, Nicholas, &
Christiansen, 2016). The researchers identified the limited number of apps, the dynamic nature
of the app marketplaces, and the inability accurately access the app components as possible
limitations to the study (Larsen, Nicholas, & Christensen, 2016). The data from this study
showed that there is an increased possibility of unethical and dangerous practices in areas where
psychology and technology meet without the proper guidance of mental health professionals.
This study combined with the findings of the previous study, should be used to encourage the
exploration of the use of different forms of technology within the mental health fields with a
small amount of caution and a reliance on empirically sound studies.

Contemporary Issues

The discussions concerning ethics appeared to highlight the privacy and security
challenges that could prove to be incredibly difficult to overcome. Surveys were shown to be the
most used and most efficient method of understanding the behaviors of today’s professionals and
college students. Many of the ethical challenges have also deeply impacted the contemporary
issues that will be discussed throughout this review. As the demand for mental health services
continues to rise, telemental health services and other computer-based mental health services
have become increasingly accepted alternatives (Klee, Stacy, Rosenback, Harkness, & Tsai,
2016). The area where the ethical issues and contemporary issues crossed paths in the most
visible manner involved the individuals that relied on the services. Several of the previously
conducted studies that are discussed in this review analyzed the use of certain health
technologies on a very broad portion of the population. Many of the studies have proven to be incredibly beneficial and yet many have also failed to provide client-focused view of the use of technology to provide mental health services.

**Computerized behavior therapy.**

Professionals within the field of psychology have incorporated a wide variety of software and hardware into their clinical practices while these technologies have become increasingly ubiquitous in today’s fast paced society. Technological innovations in mental health are capable of providing care across long distances to clients around the world. Once the ethical considerations have been thoroughly discussed, it will be critical to take a step back and focus on the other issues that are currently affecting the field.

A team of researchers identified the need for a thorough reevaluation of the current drug abuse treatment systems and the obstacles that a new system might likely face (Bickel, Buchhalter, Marsch, & Badger, 2008). The researchers suggested that the current system suffers from a difficulty in recruiting and retraining staff, poor financing, an inadequate number of treatment options, and a slow adoption of treatment innovations (Bickel et al, 2008). The researchers decided that computer-based interactive technologies could be used to provide substance abuse treatments and partially address many of the issues that are involved with the current system so they chose to test the efficacy of the method (Bickel et al, 2008).

Computer-based substance abuse treatments have been shown to be comparable to face-to-face cognitive behavioral treatments in the past (Bickel et al, 2008). The increasingly popular method stands at the forefront of the technologically inspired evolution of psychology. The participants consisted of 135 opioid-dependent adults that were involved with the study’s 23-week outpatient maintenance treatment phase (Bickel et al, 2008). Through the use of
newspapers, television, and radio, over a two year period, the researchers screened the participants for drug dependence that met the DSM-IV criteria (Bickel et al, 2008). Each of the participants were randomly placed in one of three treatment groups that analyzed the use of computer-based behavioral therapy interventions that were grounded in the community reinforcement approach (CRA) and the voucher-based contingency management model of behavioral therapy (Bickel et al, 2008). The treatments involved computer-assisted programs and therapist-delivered programs which provided a very clear comparison between the more traditional therapists led methods and the emerging technology-based methods.

The results indicated that the computer-based treatments were just as effective in treating and minimizing the cravings for opioids as the therapist-delivered treatments (Bickel et al, 2008). Despite the limited number of participants, the focus on an entirely clinical setting, and the lack of follow-up data, the conclusions that could be drawn from this unique study could be groundbreaking. The study proved that computerized interventions could be used as cost effective tools that could be easily incorporated into traditional cognitive-behavioral treatment interventions without jeopardizing the quality of care. Technology can be used as an alternative or as a supplement to opioid dependence treatments.

The benefits of computerized mental health services can easily become inaccessible to individuals that were diagnosed with severe mental illnesses that lack access to computers, smartphones, email, or the Internet (Klee et al, 2016). A team of researchers from the Connecticut Veterans Affairs Healthcare system and the Yale School of medicine set out to identify the barriers that have complicated the use and effectiveness of technology-assisted care in the Veterans Health Administration (VHA) due to the recent efforts of the VA to champion
the use of health technologies and the large number of veterans that have been diagnosed with severe mental illnesses (Klee et al, 2016).

The participants consisted of 210 veterans that were recruited from community-based and homeless mental health programs (Klee et al, 2016). Each participant completed a survey that assessed their sociodemographic information, psychiatric diagnoses, and questions that ascertained each participant’s willingness to use certain forms of technology (Klee et al, 2016). The surveys also relied on ratings of each respondent’s willingness to use the Internet for activities such as obtaining news and researching health services (Klee et al, 2016). Through a series of logistic regression analyses, the authors identified correlates between the use of certain technologies, owning cellphones, and a willingness to use computerized therapy (Klee et al, 2016).

The study’s conclusions proved to be important because they focused on an understudied area of psychology, the use of technology by individuals that diagnosed with serious mental disorders. The data indicated that 57% of veterans with serious mental illnesses use the Internet and 80% owned a cellphone (Klee et al, 2016). Only 30% of the respondents indicated that they owned a computer while only 13% owned a smartphone (Klee et al, 2016). The authors compared the data to the national averages and discovered a significantly lower number of veterans that used and had access to various forms of very common technology when compared to the average American household (Klee et al, 2016). The difference between the averages was as high as 35% (Klee et al, 2016). The information suggested that veterans with serious mental illnesses experienced disparities in their access to technology, which could severely impact their use of a technology-based healthcare intervention (Klee et al, 2016). There were a few small limitations that involved an advanced aged pool of participants that did not reflect the behaviors
of the average American. Although technology has improved society’s access to mental health services, it has also made many of the economic and cultural divides more apparent. Individually diagnosed with serious mental illnesses are reflective of a portion of the population that could benefit from the long distance services if they are provided with the tools that they would need in order to access it. If these important segments of the population are not encouraged to utilize the valuable tools that this review will discuss in detail then the field of psychology will fall short of achieving its goal of providing care to those that need it most. While this study successfully managed to identify the relationship between specific mental disorders, technology preferences, and the general use of technology, it provided a very limited insight into each participant’s desire to engage in the mental health services that were primarily computer-based. Given the increasing number of professionals that have begun to gravitate towards online treatments, it is important to gain a good grasp on the public’s perception of this particular issue (Harris & Kurpius, 2014). The next study will fill in the gaps that were left by this study in relation to the perception of technology.

**Social media and sobriety recovery.**

Donald Grant & Karen-Dill Shackleford (2016) stated that there were several benefits and drawbacks to both mediated and face-to-face social interactions in therapy, which inspired them to engage in research that addressed several issues surrounding face-to-face versus mediated sobriety support (Grant & Dill-Shackelford, 2016). The researchers hypothesized that the face-to-face modality would be the preferred method of therapy (Grant & Dill-Shackelford, 2016). The researchers utilized a unique approach to recruitment that solicited participants with social media-oriented recovery support through unsolicited Facebook friend requests (Grant & Dill-Shackelford, 2016). The authors sent message invitations to profiles that strongly suggested
sobriety recovery efforts while also posting to mediate sobriety pages that were dedicated to sobriety recovery efforts (Grant & Dill-Shackleford, 2016). The 196 respondents self-reported an active engagement in sobriety recovery with an average of 1 continuous year of recovery and face-to-face support functions (Grant & Dill-Shackleford, 2016). The data was collected through the use of the Sobriety Support Preference Scale (SSPS); the researchers compared the beliefs, actions, and status of recovery in the face-to-face experiences with their mediated experiences (Grant & Dill-Shackleford, 2016). The data confirmed the researchers’ hypothesis that its indication that the preferred method of counseling was the face-to-face intervention (Grant & Dill-Shackleford, 2016). The researchers also interpreted the results from the scale as potential predictors of a future migration toward mediated therapy and a transition away from face-to-face sobriety support options (Grant & Dill-Shackleford, 2016).

While the levels of participation in the face-to-face sobriety sessions predicted greater reported recovery, the opposite proved to be true for the mediated therapy, which reflected the realities of technology as opposed to the potentially unrealistic expectations that are commonly associated with future advancements. The lack of success in the mediated sessions directly conflicted with a majority of the other studies in this review. The increased potential of deception, the unique participant recruitment methods, and the advanced ages of the participants may have contributed to the unexpected outcomes. The study showcased the potential success of a sobriety support system that can be life-saving and capable of incorporating technology that can improve its ability to reach a large number of high risk individuals (Grant & Dill-Shackleford, 2016). Although face-to-face interactions proved to be superior to mediated interventions, this study showed that the gap between the two forms of therapy might be closing at a rapid pace (Grant & Dill-Shackleford, 2016). This study involved the use of social media as a
cheap and easy-to-use data collection tool, which the next study will provide a valuable analysis of.

**Social media recruitment and data collection.**

The previous study involved the recruitment of participants by searching through Facebook profiles that contained information that related to sobriety support (Grant & Dill-Shackleford, 2016). The growing social media phenomenon and the increased reliance on the Internet have almost rendered the survey delivery methods of many earlier studies, obsolete (King, O’Rourke, & DeLongis, 2014). Advanced technology has enabled researchers to overcome the challenges that stemmed from the human error that occurs with data input, expensive experiments, and time consuming experiment planning (King, O’Rourke, & DeLongis, 2014).

In order to determine the efficacy of social media recruitment options while determining the best practices, the Canadian researchers used Facebook advertisements to recruit 1011 adults that were previously diagnosed with Bipolar disorder (BD) (King, O’Rourke, & DeLongis, 2014). The ads were viewed 35.3 million times by 6.2 million English-speaking Facebook users (King, O’Rourke, & DeLongis, 2014). The cheap ads proved to be particularly effective for the older participants as well (King, O’Rourke, & DeLongis, 2014). The study also highlighted the fact that individuals that are diagnosed with BD made up only 2% of the Canadian population which showed that social media research approaches have created newfound opportunities to collect data from many less prevalent and geographically isolated populations that may have previously lacked the ability to connect with valuable mental health resources (King, O’Rourke, & DeLongis, 2014). The size and accessibility of social media databases and the ability to make appeals directly to potential participants made it an invaluable and increasingly popular research
tool (King, O’Rourke, & DeLongis, 2014). As populations continue to become more diverse and
technologically intertwined, innovative research strategies that are similar to the previously
described one will likely become more common (King, O’Rourke, & DeLongis, 2014). This
study proved to be the ideal example of the ways in which technology has improved the
effectiveness of mental health research. The following study will focus on the media influence
that continues to affect the responses that drove this study.

**Media influences and self-stigmas.**

The prevalence of technology has made the access to certain forms of media
entertainment more accessible. According to Maier, Kaplan, Gentile, & Vogel (2014), the
growth of entertainment media has resulted in a massive amount of on-screen depictions of
psychotherapy and mental illness (Maier et al., 2014). The researchers determined that there was
a clear lack of data that involved the potential impact of the portrayals of mental health and
psychologists and set out to examine the role that the portrayals played on the self-stigmas of the
viewers. The study specifically addressed portrayals of psychologists, those who seek therapeutic
services, and individuals with mental disorders on TV shows and films (Maier et al., 2014).

Given the large number and general popularity of shows that include individuals that are
associated with mental disorder and the power of the public’s perceptions of therapy, this study
provided a large amount of thought-provoking background information that could be used to
analyze this topic in future studies. Studies such as the Grant & Dill-Shackleford (2016) study
dedicated a portion of the study to the perceptions of certain therapeutic mediums in order to
highlight the power of such interpretations. This study researched the potential roots of those
pivotal perceptions.
In the first portion of the study, 108 students participated in the completion of a 10-item scale that was designed to assess the nature of their self-stigmas and their beliefs concerning certain mental health seeking behaviors (Maier et al., 2014). The data showed that there was a correlation between each of the perceptions of therapists, mental illness, and their self-stigmas (Maier et al., 2014). This portion of the study failed to identify a clear distinction between the reasons behind many of the negative feelings toward therapy which may have impacted the conclusions that the authors discussed at the end of the study. It was unclear whether the respondents perceived all help-seeking behaviors in a negative light or if the specific mental health help-seeking behaviors were viewed as negative (Maier et al., 2014).

The second half of the study expanded on the findings of the first half of the study by recruiting an additional 327 students, requiring them to complete the same scales as the previous group along with an additional survey that involved their opinions of specific TV and movie characters (Maier et al., 2014). The data indicated that there was a distinct correlation between the ways in which the respondents perceived the portrayals of therapists, mental disorders, self-stigma, and the act of seeking therapy (Maier et al., 2014). The more positive the participants viewed the movie/TV character’s behavior, the more likely they were to seek help themselves (Maier et al., 2014). As technology continues to make certain mental health services more accessible, it will also make certain types of entertainment media more present in society’s day-to-day tasks. This study showed that the strong relationship between the perceptions of persons with mental illnesses and certain mental health behaviors can become powerful barriers to treatment that will require further analysis.
Social media use in rural areas and telepsychology.

In a study by Ryan Reed, Erick Messler, Terrance Coombs, and Randal Quevillon (2014), from the University of South Dakota, the stigmas and confidentiality concerns of the rural communities took center stage. Through the use of yet another well-formatted study, the researchers examined the effects of social media use and population size on the perceived use and openness to the telepsychological services (Reed et al, 2014). Two hundred forty-one students from a Midwestern university completed an online questionnaire that measured each participant’s computer use, social media use, and beliefs surrounding telehealth services (Reed et al, 2014). A thorough hierarchal regression analysis revealed a strong link between smaller populations, increased social media use, and positive perceptions of telehealth services (Reed et al, 2014). The study may have been limited by the lack of data concerning each participant’s past experiences with telehealth services and a pool of participants that did not accurately represent the rural populations that it initially sought to understand (Reed et al, 2014).

In spite of the apparent limitations, the current study succeeded in presenting the statistically significant predictive validity of population size and social media use on perceptions of telehealth (Reed et al, 2014). The study also suggested that urban populations are more skeptical of telehealth services with less social media use and less skeptical as they use social media at an increased rate (Reed et al, 2014). Although the diverse use of social media has become a growing trend in the field of psychology, there are still certain individuals within the population that might resist or remain skeptical of the changes (Reed et al, 2014). This study, along with the previous studies showed that there is still a great deal that must be learned about the perception and execution of technology-based mental health programs if the field of psychology plans to keep pace with the other important social issues that involve security and the
availability of health services. Psychology is a scientific field that has enabled well-trained professionals to reach clients that are in need of assistance in a variety of increasingly innovative and complex ways (Reed et al, 2014). Technology has clearly inspired a rapid change that has opened new doors to care and connected clinicians to clients in previously unforeseen ways as new challenges continue to develop (Reed et al, 2014). The following studies briefly discussed two specific topics that have also experienced dramatic changes in the past decade.

**Physiological Psychology**

**Neuroscience and neuroimaging.**

A wide range of mental disorders were previously linked to genetic and neurodevelopmental issues that could not have been discovered without the connection between multiple scientific disciplines. As the field of psychology integrated advanced neuroimaging machines and software into its research processes, scientists were able to discover the physiological underpinnings of a long list of disorders, which has improved the use of medication and therapeutic treatments (Baillieux, Smet, Wackenier, Praeter, Engelborghs, Paquire, Deyn, & Marien, 2009). A perfect example of a technologically-inspired bridge between multiple fields occurred in a study that investigated the acute and long-term linguistic, cognitive, and affective symptoms of eight children that underwent posterior fossa (PF) tumor resection (Baillieux et al, 2009). The researchers focused on the symptoms that occurred following a PF resection because of their desire to understand posterior fossa syndrome (PFS) which consists of a transient cerebellar mutism, cognitive impairments, and neurobehavioral abnormalities (Baillieux et al, 2009). Eight pediatric patients with PF tumors were tested during the immediate post-operative phase as well as a 2-year follow-up (Baillieux et al, 2009). The children completed the neuropsychological protocol of multiple standardized tests and assessments such
as the Wechsler Intelligence Scale for Children and the Wisconsin Card Sorting Test (Ballieux et al, 2009). The participants were also subjected to a post-operative brain perfusion Single Photon Emission Computed Tomography Study (SPECT) along with multiple brain image analysis procedures (Baillieux et al, 2009). The results showed that PFS could represent a cerebellum-cerebral diastasis phenomenon that reflected the effects of cerebellar lesions on the brain (Baillieux et al, 2009). Due to the thorough nature of the study, the small sample size and the lack of an explanation detailing the physiological causes of the disorder might be the only visible limitations.

This study reinforced the general theme of the review through its use of the SPECT alongside the cognitive measurement tests that allowed the researchers to gain a valuable insight into the PFS in a way that would not have been possible in the past. The new use of technology revealed the neurological links to a syndrome that causes several very apparent symptoms and abnormalities. The next study will follow in the footsteps of this study by taking post-traumatic stress disorder (PTSD) and searching for its neurological roots through the use of neuroimaging as well.

**The neurobiology of PTSD.**

An international team of researchers from several prestigious universities across the United Kingdom and Germany, recognized a common and yet poorly-studied attribute of many emotion regulation studies that associated the neural correlates of memory impairments with trauma survivors (Dorfel, Werner, Schaefer, & Karl, 2010). Through the use of a correlational design, the researchers investigated the relationship between PTSD symptom severity, hippocampal volume, episodic memory, and brain activation during a specifically designed memory test (Dorfel et al, 2010).
The participants consisted of eleven non-medicated traumatic event survivors that passed the initial screening of the study (Dorfel et al., 2010). The Wechsler Memory Scale (WMS) and the Remember-Know task were used to assess each participant’s neuropsychological and memory abilities (Dorfel et al., 2010). The study identified positive correlations between PTSD symptom severity and the activation of areas in the brain involved in the episodic recognition network while higher PTSD symptoms negatively correlated with brain activations in the areas of the brain that are associated with episodic memory (Dorfel et al., 2010). In this case, the MRIs revealed an unexpected relationship between the activation of specific areas of the brain and the severity of PTSD symptoms (Dorfel et al., 2010). The results could be used to change the methods that are used to identify disorders. The small sample size and limited diversity among the participants may have impacted the general interpretation of the study (Dorfel et al., 2010). The pilot study took important steps to uncover a less visible side of a major disorder through the use of technology.

Margaret Moulson, Charles Zeanah, Nathan Fox, and Charles Nelson (2009) also sought to discover the neurobiological consequences of a potentially traumatic event through the use of neuroimaging. The researchers focused on the impact that early institutionalization had on the neurobiology of facial emotional processing (Moulson et al., 2009). Early institutionalization has been attributed to attachment problems, behavior problems, and indiscriminate friendliness with only a small number of studies that have explored the origins of many of the issues (Moulson et al., 2009). In response to a perceived lack of usable data, the researchers recruited 208 children from Bucharest, Romania to take part in the Bucharest Early Intervention Project, which was a longitudinal study that studied the neurological functions of three groups of children (Moulson et al., 2009). One group consisted of a never-institutionalized group of children while the other two
groups were a continued institution care group of 63 and a foster care group of the same number (Moulson et al, 2009). Each child was shown a series of color pictures of faces that expressed a small range of emotions such as anger, sadness, and happiness (Moulson et al, 2009). Electrophysiological processes were recorded and catalogued as the children were exposed to images through the use of Lycra Electro Caps (Moulson et al, 2009). Following the establishment of a baseline, the data was compared to the other tests that occurred as 31 and 42 month periods (Moulson et al, 2009). The first important finding showed that institutionalized children demonstrated a diminished ability and extended latency for the occipital components compared to the never-institutionalized group, which remained consistent with other, similar studies (Moulson et al, 2009). There was also an improvement in the children that were placed in foster care (Moulson et al, 2009). The timing and age of the children were not significant factors in predicking each child’s response to intervention (Moulson et al, 2009). The study proved to be a valuable source of information that embodied the growth and knowledge that can be attained through the melding of technological advances and psychology. While the studies have focused on the understanding of certain disorders and behaviors on a neurological level, the next study will target a specific treatment option.

**Behavioral treatments for gambling.**

A team of researchers recognized the need for a study that combined updated information with biological findings that improved certain therapeutic methods after analyzing the considerable advances that have led to the discovery of the biological underpinnings of pathological gambling (PG) disorder (Potenza, Balodis, Franco, Bullock, Xu, Grant, & Chung, 2013).
The study relied on 7 treatment seeking individuals that agreed to participate in 6 weeks of cognitive behavioral therapy (CBT) that involved imaginal desensitization and motivational interviewing (IDMT) (Potenza et al, 2013). A Yale-Brown Obsessive-Compulsive Scale that was adapted for PG (PG-YBOCS), was used with fMRIs to assess the severity and changes of the PG symptoms after the baseline/pretreatment stage of the experiment (Potenza et al, 2013). Changes in the PG-YBOCS correlated positively with the activation in the ventromedial prefrontal cortex, which linked the treatments to the underlying neurological changes and function of a specific part of the brain (Potenza et al, 2013). This study also suffered from a very small sample size and a small number of methodological issues that were discussed in the study (Potenza et al, 2013). Unlike the previous studies, this study used an experiment to examine the efficacy of identifying the neural mechanisms that are connected to specific behavior therapies (Potenza et al, 2013). The very broad goal of enhancing and adapting behavioral therapies by understanding the mechanisms of the brain was feasible because of the technological advances that have become an essential part of neurological/psychological research (Potenza et al, 2013). The next study utilized a combination of neuroscience and psychology in an attempt to use a method of therapeutic improved that mirrored this study.

The neuroscience of play therapy.

In response to a lack of research concerning the effectiveness of pedagogical models and methods for teaching the neuroscience of play therapy, Tony Michael and Chad Luke (2016) from Tennessee Technological University analyzed the metaphoric approach. The metaphoric approach entailed the recognition of the science of the mind and brain that is applied to the human condition with the acceptance of the gaps in neuroscience research (Michael & Luke, 2013). Ten counseling and psychology students were evaluated as participants while engaging in
an introductory play therapy course (Michael & Luke, 2013). Using a computer-based, self-report questionnaire with a brief interview, the researchers determined that the metaphoric approach caused the students to view the integration of neuroscience technology into the field of psychology, in a unique manner that improved their learning skills (Michael & Luke, 2013). The reliance on a potentially biased student response and the all-too-common limited sample size, may have severely limited the study (Michael & Luke, 2013). The study successfully showed that the implementation of new, metaphoric approaches can stimulate growth and provide beneficial teaching results when combined with new forms of technology. The final study will also involve student learning outcomes.

**Predications and neurological imagery.**

Through a careful examination of the utility of behavioral standardized tests and the functional neuroimaging measures of children at the start of a school year, a team of researchers form Carnegie Mellon University and Stanford University tested the predictability of each child’s learning ability (Hoeft, Meyler, Glover, Kooayashi, & Just, 2007). The participant pool was composed of 64 children that were recruited for a larger study of children in the Pittsburg area (Hoeft et al, 2007). Several reading comprehension tests were used as fMRI images were recorded and analyzed (Hoeft et al, 2007). The results indicated that neuroimaging measures could be used to accurately predict decoding skills at the same level of accuracy as current standardized tests (Hoeft et al, 2007). The data also showed that the combination of neuroimaging measures and behavior tests was superior to each individual measure separately (Hoeft et al, 2007).

This data was significant because it showed that a combination of traditional behavioral tests and new forms of neuroimaging technology can be used improve early interventions and
student reading skills (Hoeft et al, 2007). The final study brought the two realms together in a way that will likely become the standard procedure in the upcoming years. The next section will discuss learning and cognition which the previous studies only partially discussed.

**Learning and Cognition**

**Electronic portfolios and self-regulated learning.**

Technology has become a fundamental force in shaping the beliefs, cognitive and effective processes, and the interpersonal activities of students (Abrami, Venkatesh, Meyer, & Wade, 2013). Despite the abundance of positive attributes that this review has discussed thus far, there are is still a lack of fundamental literacy in many countries (Abrami et al, 2013). The researchers also discussed their belief in the use of self-regulated learners that are active participants in their own academic journeys (Abrami et al, 2013). Electronic Portfolios, which are digital containers that can store videos, images, and sounds, could be used as tools that enable students to interact with digital media in a way that could improve metacognitive skills (Abrami et al, 2013). Twenty-one teachers and 319 students completed a series of questionnaires and used a computer-based program for an entire semester of school (Abrami et al, 2013). The use of the EPs had a positive impact on the student scores which highlighted the fact that theoretically based knowledge tools can be used to dramatically improve learning environments (Abrami et al, 2013).

**Web-based interventions for teachers.**

The researchers from Dalhousie University developed a pilot study evaluated a web-based intervention for elementary school teachers that had at least one ADHD diagnosed student in their class (Barnett, Corkum, & Elik, 2012). Nineteen elementary school teachers completed a seven week session that consisted of PowerPoint presentations, web links, and discussion
activities that related to ADHD (Barnett, Corkum, & Elik, 2012). The limitation of the small sample size did not affect the increased knowledge and confidence that the data showed (Barnett, Corkum, & Elik, 2012). The study demonstrated the efficacy of a web-based intervention in a very complex environment over a short period of time. The next study will add to the research that was conducted in an effort to uncover the efficacy of EP by evaluating textbook technology supplements.

**Textbook technology supplements and virtual humans.**

In a similar fashion to the discussion involving EPS, Matthew Bell, Patricia Simone, and Lisa Whitfield (2016) sought to understand the textbook technology supplements (TTSS) and their ability to enhance student learning outside of normal learning environments (Bell, Simone, Whitfield, 2016). The participants consisted of 75 psychology students that would divided in half and randomly assigned to a group that was required to use a TTSS program and a group that did not (Bell, Simone, Whitfield, 2016). The data showed that there was not a noticeable difference between the two groups which provided a more realistic view of certain forms of technology. The data directly contrasted many of the other studies in the review, due to its inability to provide a recognizable description of the program that was used. The next study will also discuss the use of a software-based form of technology.

Several researchers described pedagogical agents as animated characters in learning environments that act as tutors while working alongside learners (Lane, Hays, Core, & Auerbach, 2013). The virtual humans were used in a game-based system that was designed to teach intercultural communication skills to determine whether a social simulator required a specific amount of audio fidelity and visual clearness to successfully be used (Lane et al, 2013). One group used a 2D, non-audio/visual program while the other program used 3D, realistic tutor
(Lane et al, 2013). Surprisingly, there was not a significant difference between either experience with the 46 college student participants (Lane et al, 2013). The next study took the idea of a personalized environment and expanded upon it.

**Adaptive learning technologies.**

The use of customized learning technologies was briefly touched upon by several of the other learning and cognition topics. Candace Walkington (2013) decided to take the previous studies a step further by studying a technology-based personalization intervention with an intelligent tutoring system (ITS). The experiment was conducted by recruiting 145 ninth-grade students use the Cognitive Tutor Algebra ITS (Walkington, 2013). Each student was randomly placed in a group that received the normal questions and a group that received specifically tailored questions that adhered to their interests through the adaptive program (Walkington, 2013). The results showed that the students that received the specific questions outperformed the other group of students in a significant manner (Walkington, 2013). Despite the generally small number of students, the study provided evidence for an increased use of learning technology that can adapt to each individual student and improve their comprehension of the information (Walkington, 2013).

A team of researchers attempted to gauge the efficiency of assistive navigation technologies through the use of a virtual environment and a treadmill interface (Schellenbach, Lovden, Verrel, Kruger, Lindenberger, 2010). The researchers utilized their knowledge of the sensorimotor and cognitive resources that are required to use other forms of assistive technology, and developed a spatial navigation aid that could be used to improve the decline in spatial navigation performance that is commonly attributed to older adults (Schellenbach et al, 2010). Eighteen individuals that ranged from 21 to 28 years of age were recruited and placed in the
“younger” category while 18 individuals that ranged from 68 to 77 years of age were placed in the “older adult” group. Each participant completed a series of tests that were designed to measure each participant’s cognitive abilities and motor skills (Schellenbach et al, 2010). The participants were placed on a treadmill that was connected to multiple sensors and cameras while they navigated a virtual environment that was made up of a series of mazes and obstacles (Schellenbach et al, 2010). Virtual reality headsets were used to immerse each participant into the environments which set this particular study apart from the others. The results showed that the assistive technologies improved the navigation skills of both groups, but the more cognitively demanding the devices negatively affected the older group in a significant manner (Schellenbach et al, 2010). Although the virtual environment provided an ideal opportunity to record the necessary data, it also limited the study’s ability to be applied to natural environmental settings. The application of multiple software and virtual platforms into a psychological endeavor made this study a shining example of the possibilities that technology created within the mental health fields. The next two sections will briefly discuss the conclusions that were made based on the information that was presented in this review as well as the topics that should be researched in the future.

**Discussion**

Because the studies that were discussed occurred within the past decade, the topics that related to contemporary issues appeared to be relevant to each area. Although the common theme of technology proved to be very apparent throughout the entirety of the review, it is still important to highlight the core areas that became relevant to the overall theme of the paper. Despite the fact that there are several guidelines concerning the use of client data and privacy issues, the guidelines surrounding the use of technology in terms of social proximity and use of
private information searches proved to be inadequate in many of the ethical surveys. The research team of Elhai & Hall (2005) along with Allen & Roberts (2011) stated that the APA would ultimately need to revise the current ethical codes in order to meet the demands of the current technology. Several of the studies in the ethics portion of this review relied on the real-world experiences of today’s professionals and future professionals to assess the magnitude of today’s technology-related demands. There was a clear and very consistent lack of understanding concerning Internet security and data security that permeated many of the studies (Harris & Kurpius, 2014). The literature related to ethics has increased, but to truly overcome the new ethical dilemmas, there is considerable work that needs to be done. While technological advancements have improved today’s therapeutic services, they have also created unforeseen dilemmas that were discussed at length in the review.

The impact of certain technological advances in the areas of education and physiological research was shown to be predominantly positive. Advancements in neuroimaging and genetics have revealed important physiological underpinnings of mental disorders, which have led to improvements in the methods that are used to treat the complex challenges that are presented by certain disorders (Michael & Luke, 2016). Research that has occurred over the past decade was used to discuss the link between technology and the breakthroughs that have played a significant role in the field of psychology. As health technology continues to expand, so will the field’s access to remote populations and treatment capabilities (Potenza et al, 2013). Future studies should continue to focus on the ways in which these advancements can be further incorporated into psychological research.

The Internet has proven to be incredibly useful for training and educating teachers, students, and counselors (Barnett, Corkum, & Elik, 2012). The increased access to technology
and the increasing number of students that are motivated to use educational software are important factors that can increase the academic performance of students from a variety of cultures and socioeconomic levels (Abrami, Venkatesh, Meyer, & Wade, 2013). Given the challenges and risks of a reliance on potentially unethical practices and widespread Internet use as a therapeutic tool, psychologists must be careful when considering the use of certain forms of technology. While a majority of the learning and cognition studies showed that the integration of technology into the learning environment was positive, there were a few studies that highlighted the lack of an effect altogether (Abrami et al, 2013). Due to the common expectation of positive outcomes that are motivated by technology, future studies should attempt to understand the role that such expectations might play on the successful use of educational software.

More research needs to be conducted to better understand the ethical issues that are faced by today’s psychologists and future professionals. Such knowledge will contribute to finding better ways to incorporate technology and increase society’s access to valuable mental health services. The APA should also use the information related to this study to improve the Codes of Ethics and address any ethical ambiguity that exists. Mental health professionals should also continue to research new and improved methods of delivering their well-tested methods in order to maintain the high level of competence that has successfully elevated the field of psychology to its current prominence.

Future research should also focus on how social media and online culture are influencing the field of psychology through the continuation of studies that are directed towards the behaviors of the students that will one day become the leaders within the field. Studies such as the Harris & Kurpius (2014) study showed that there is a much deeper understanding of the
current state of ethics and technology that can be gained through the analysis of each clinician’s beliefs and behaviors. The study that was performed by Elhai & Hall (2005) showed that privacy and confidentiality will take a new shape in the future and it will be vitally important to become aware of the methods that psychologists might use to change or hide their identities in a world where personal information can easily be accessed and collected by clients. There was a clear lack of data concerning the Internet research behaviors of clients that should also be addressed in the future.

Conclusion

Several studies showed that the impact of certain technological advancements might not be as powerful as one might initially expect. The research discussed within this review explored a vitally important chapter in the ever-changing story of psychology. The Internet provides easy access to information and resources. Furthermore, as suggested by the research reviewed, when the use of the Internet and other advanced communication tools occurs without the clear guidance of clearly developed standards, ethical issues will occur. Regardless of the potential drawbacks, new forms of technology can have a positive impact on research, education, and the entire therapeutic process.

This review should be used as a first step toward a much-needed understanding of an unavoidable and potentially revolutionary change that will continue to occur in the field of psychology as a direct result of technology. The future of online therapy could involve interactive online services, protected digital transmissions, and an integration of online face-to-face therapies. The availability and ease of certain forms of technology can enrich the field of psychology in many ways. This growth, however, is not entirely positive. Professionals within the field of psychology must continue to reflect upon the consequences of the use of technology
in practice and remain aware of the potential dangers that might hinder the adoption of online therapy and computer-based educational programs in the future.
References


