

Technology and the Adolescent: Pairing Modern Media and Technology with Mental Health Practice

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Throughout the National Institute of Mental Health (NIMH) Strategic Plan (2007), there is repeated mention of the need for “novel and innovative research” and focus on “personalized” preventative and therapeutic approaches. In addition, their strategic plan emphasizes the need for more efficient methods for conducting research and expedited dissemination of programs that are shown to improve outcome and adherence.

In our own practices, schools, and clinics, we have witnessed our current child and adolescent population interacting with new technology in a way that could almost be described as instinctual. These youth are the first of a new generation who have been raised with regular access to a combination of personal computers, the Internet, and portable devices equipped with mobile media (*including cell phones, iPods, portable gaming, and other hand held devices*).

Instead of the informal hanging-out spaces of the school, mall, home, or street, these new generations are also employing “contemporary social media” to create the new “primary institutions” (p. 39) of peer culture (Digital Youth Project 2008). They are connecting and hanging out through the use of technology. It is here that we find the opportunity for entirely new ways of interacting with, engaging, and tracking youth and their treatment in mental health care.

In 2001, Marc Prensky published companion papers that coined the term “Digital Natives” to describe this technologically fluent generation. Prensky (2001) labeled their adult counterparts as “Digital Immigrants.” Most recently, Prensky has broadened this concept to include the development of an evolutionary piece, “Digital Wisdom.” Prensky defines “Digital Wisdom” as “a twofold concept, referring both to wisdom arising from the use of digital technology to access cognitive power beyond our innate capacity and to wisdom in the prudent use of technology to enhance our abilities (Prensky 2009).” While Digital Natives and Digital Immigrants defined technology use as generational, Prensky’s piece on Digital Wisdom sets a more modern distinction, between users of technology and their counterparts, that no longer relies on the age of the user but rather by their own patterns of technology use.

We believe our mission, in this next phase of development for social science, is to foster education and training that builds the ‘Digital Wisdom’ of practitioners, accelerates the pace of our research, and helps to bridge the cultural gaps between the practitioners and educators and the youth of today. Somewhere between these groups, there lies the potential for a powerful merger between experience and the demands of a new culture.



In their recent brief, “Adolescents and Electronic Media: Growing up Plugged In,” authors B. Brown, Ph.D. and P. Marin, M.P.P., offer further support for developing mental health and social services which incorporate technology and media. Their writing places emphasis on the importance of research that addresses the influence of media on health and development (Brown & Marin, 2009). They also reinforce a point made by the NIMH, “data collection must keep pace with this changing environment” (Brown & Marin, 2009).

In the following white paper, we are presenting a collaborative effort to address the use of technology for the purpose of advancing child and adolescent mental health care. In the first section we will explore considerations for introducing innovation into practice. In the second section we will provide examples of technology being used in our own and the practices of others for the purpose of strengths based treatment, engagement, provision of services, accessibility to care, and data collection. In the third section, we will discuss some examples of new technology that have potential for use in mental health care programs. In the fourth section, we will discuss the implications of some of these new tools, including some advantages and challenges, as well as areas of general concern when discussing the use of certain technologies and billing practices. Finally, our conclusion will offer a brief overview and summary of our findings.




Section One: Considerations

As the pace of technological advancement continues to accelerate, practitioners are presented with numerous new tools and options that can be used to interact with and engage their clients. Similar to previous efforts in other areas such as industry and medicine, new and creative paradigms that include innovations in treatment are being developed and applied to existing mental health practices. At the same time, the question of whether or not to adapt current treatment procedures through the introduction of new technology is still considered a controversial topic. For example, it has been argued that combining new technology with established practices may change the treatment approach altogether. From another perspective, research on the diffusion of innovations (e.g., Rogers, 1995) indicates that changes in core technologies are often a necessary part of fostering ongoing adoption and dissemination of existing practices. To address this issue, this portion of our paper will include a discussion about a recent study that compared the traditional delivery of evidence-based practices with a modified system for delivery to determine the relative advantages of adapting new innovations.

Rogers (1995), who has written extensively on the dissemination process of innovation in various fields, described a number of factors that may enhance the adoptability and ‘buy-in’ required for innovations to become standard practice. Specifically, Rogers described “compatibility” as a variable affecting the adoptability of innovations (p. 207). In the context of mental health, this variable may be described as ‘the perceived compatibility between a clinician or client and the innovation.’ While it is likely that youth and technology are compatible in terms of personal use, it is still important to establish compatibility within the context of mental health and the specific ways in which technology can address mental health difficulties by new and different methods.

Recent research has suggested that the compatibility of innovations with clinicians may be influenced by how those innovations are perceived by practitioners (Borntreger, Chorpita, Higa-McMillan, & Weisz, 2009; Kazdin, 2008). For example, Borntreger and colleagues examined therapists’ attitudes towards evidence based practices following training in two such approaches. In the first group, therapists followed a standard approach that adhered to traditional treatment manuals for specific families of disorders. In the second group, therapists used a modular approach where traditional treatment manuals were broken down according to their common elements. Therapists were directed to apply those evidence-based elements according to a decision-making algorithm, rather than adhere to the sequential manner that is part of most treatment manuals. This ‘packaging’ of treatment procedures was an essential part of the overall study.



Despite few real differences in application or technique, as well as essentially identical trainings, participating therapists reported more favorable attitudes toward the modular approach to treatment. The authors hypothesize that the differences in attitudes were the result of the perceived flexibility in treatment application and therapist involvement in the decision-making process.

In this study, the 'innovation' was the modular approach to treatment techniques. Previous findings, from decades of research, demonstrated that the techniques revealed a relative advantage over usual care treatment (Kazdin, 2008). The authors hypothesize that by enhancing the compatibility of new technologies through 'packaging,' results will include improved dissemination.

In a recent article addressing evidence based treatments and dissemination, Unützer (2008) points out a common misconception that published articles do not necessarily translate into "linear diffusion." Unützer (2008) also reinforces the importance of 'packaging' by noting that cost, relative benefit, program flexibility relative to clinical outcomes, and the ability for practitioners to try out new innovations before committing to implementation can have a significant effect on the "likelihood of diffusion."



Section Two: Technology in Practice

Topic: Autism Spectrum Disorder (ASD) and Assistive Technology Applications

A growing body of research suggests that media and computer technology provide engaging environments for individuals with ASD. While the characteristics of these individuals vary widely and generalizations about their affinities should be made with caution, social and anecdotal reports note that many individuals with ASD are highly engaged and motivated by computers, video and related media (Shane & Albert, 2008). Educators can leverage on these preferences to address desired academic and behavioral skills for these children.


Researchers note that children with ASD have relatively strong skills with visual representations of information (Tissot & Evans, 2003). Creating learning environments that include visual media may both engage and motivate a child with autism to meet learning and behavioral goals. Teachers and therapists can use visual stimuli in communicating expectations, building social skills and encouraging appropriate peer interactions. Computer-based technology and media provide many avenues for children to learn from and generate visually based information.

In a survey of 89 parents of children with ASD, Shane and Albert (2008) found that during leisure time, children with autism tended to engage in interaction with media, preferring that to other play activities. The survey revealed that across media forms, the children had a consistent preference for animation. Many commonly used software applications on computers allow students to create media projects that include digital photos, video and animation. These types of tools can be used to engage students in tasks that are self-directed and motivating to the children.

IN PRACTICE: Creating Visual Media Projects

One way to use visual tools to create opportunities for children with ASD is for them to create media of their own. One example is our half-day digital photography workshop in which children with ASD, aged 8-12 years, spent a morning in a botanical garden. Each child was given a digital camera and told to take pictures of whatever he or she wanted.

The children were given no parameters, except a few directions on camera usage. They were asked to tell one of the adult assistants if the memory cards on the cameras ran out of room. The adults assisting in the workshop monitored the children for safety and walked around the gardens with them but gave no further directions. After they got their cameras, the children set




out on the walking path through the botanical garden. The activity was self-directed and each child stopped for as long as he or she wanted to photograph things of interest. Trees, leaves, rocks, flowers, and birds all became the subject of hundreds of pictures taken that morning. Many of the children took 40 or 50 pictures of their own during the two-hour field trip. When they returned to the classroom, they downloaded their pictures onto computers with the help of the adults and selected one picture to print out and frame. The children's photographs showed quite a lot of skill, full of unique points of view and clever compositions. One child with Asperger's syndrome wrote a one-and-a-half page narrative on the computer to accompany her picture. When their parents came to pick them up from the workshop, they expressed surprise at the creative and unique works of their children. This workshop provided the children a way to engage with their environment on their own terms, giving them the opportunity for self-directed expression and exploration. For these children, this sort of project can provide an environment to leverage on visual strengths and proclivities.

IN PRACTICE: Anime and Peer Interaction

Developing appropriate social skills is often a goal for children with ASD. These individuals can have trouble initiating communication with others, processing information and establishing and maintaining social relationships. Passerino and Santarosa (2008) studied the potential of integrating this affinity for technology with social skill building for individuals with autism. They contextualized their efforts in the bigger picture of promoting social inclusion of individuals with autism who may be systematically marginalized by society. They examined how "digital learning environments" could be constructed to foster self-regulation and interaction between individuals with ASD. In their study, they determined that interactions within digital learning environments allowed individuals with autism to increase their levels of social interactions and interpersonal skills. They noted that the use of technology alone does not bring about the changes and emphasized the importance of the "strategies" that take into consideration human, technological and methodological elements.

To foster peer interaction and develop relevant social skills, it is important to create authentic opportunities for interaction, in natural settings of classroom and school. For example, we worked with a 12-year old boy with Asperger's syndrome who had a natural inclination for working on the computer and needed opportunities to develop his social skills with peers. We encouraged him to learn and teach technology skills for which he showed aptitude. This boy demonstrated an affinity for creating computer games and computer-based animations. He was unable to participate in the school's computer club because of his social awkwardness and impatience when working with peers. Collaborating with peers was difficult for him and heightened his inappropriate behaviors. The school behavioral therapist recognized his strengths using computer software and noted that the boy may benefit from an opportunity to share his strengths by teaching others. In response, the therapist developed a project that was a natural fit for the 12-year old. First, he was given the task of learning fairly complex animation-development software. He readily engaged in this and learned how to make some



basic animations on his own. Following a natural progression of learning, he was asked to teach a peer how to make an animation. While many of his teachers had previously complained of his “inability to focus,” during this session, the 12-year old remained focused and on task for nearly an hour and a half. He was responsive to the questions of the other student, gave appropriate feedback, and constructively helped his peer improve skills with the software. More importantly, for the entire duration of the activity, this 12-year old was a teacher and was able to appropriately mentor and communicate with a peer.

When given the chance to teach others, he was markedly more patient and focused than when asked to collaborate with peers. He has continued to teach others, including a peer with Asperger’s syndrome, how to use this software. He consistently showed patience and focus when teaching and was rewarded for it by the positive feedback he got from his teachers, therapist and parents. In addition, several regular education students have begun to seek out his animation talent and instruction for collaborative art projects of their own, providing this student with a natural opportunity for social engagement with same age peers.

IN PRACTICE: Virtual Reality Technology and Professional Skills Development

In one of our practices, we are currently developing systems for the purpose of social and professional skills training with adolescent and adult clients with ASD. The software is being designed to work with two specific virtual reality interfaces, the head mounted display (HMD) and the CAVE system. The head mounted display (HMD) incorporates small mirrors and projection screens that are contained within a wearable helmet. The CAVE system can be described as a virtual theater composed of display screens that completely surround the viewer. The CAVE system gives the illusion of being immersed in a 3D environment. Both of these systems can employ the use of an accelerometer (a device that allows the virtual software to react to the movements of the person in the system). While the client is using the program, he or she has several different options for interacting with his or her environment, including the use of a joystick, human voice, or stereo 3D glasses that track the head movement of the participant.

Virtual reality environments have been shown to reduce anxiety and allow for safe and non-threatening learning and practicing of new skills (Parson and Mitchell 2002). With recent technological developments in the area of virtual reality, systems have become more affordable, accessible, and functional. Clients will have the opportunity for “hands-on” practice with communication, social interaction, educational and professional training. Clinicians will be able to choose between single or multi-user interactivity.



Design and Development:


1. The system utilizes an interactive 3D environment that can be controlled either via sound or a joystick. People with ASD are given set of goals within the environment. In one case the task is picking up boxes marked with numbers that are randomly spread across the area. Some are lined up in the shelves and some are on the floor. Each participant has to pick the numbered boxes and put them in the shelves in a pre-determined order. A feedback system (a character) interrupts if a box is placed out of order. Once the participant completes this level, he/she will be rewarded within the environment and will progress to another level of task (the scene is built with multiple levels where each level will require a slightly higher complexity of tasks i.e., the second level will have more boxes, and environmental obstacles, that need to be placed on shelves in a specific order). In some cases, clients will have to climb stairs to put away the boxes. The purpose of this training is to prepare children with ASD to navigate and interact with an object in an efficient and effective manner.

2. The next use of the system is a simulated role-play environment that includes generating a virtual village by the use of interaction, problem solving and planned strategy. In this case, a participant with ASD is given a task-based goal that requires building a virtual village. There are a number of choices; including plans, materials and tools, and characters. The proper use of sound or the joystick can help in the process of building the virtual village. Support from a virtual helper will be available during the process. This virtual helper may assist the participant to navigate in this environment or may be available to answer questions. Once the virtual village is completed, the participant will move to next level.

Before using the virtual reality system, participants are required to go through a small demonstration on how the system would work including a short video session that shows the goals and tasks that need to be completed.

Topic: Video Modeling

Video modeling is a strategy by which target behavior is demonstrated through active video representation of a behavior; video self-modeling is an extension of this concept in which the individual performs the desired behavior on video and watches this target behavior or skill in order to learn and internalize the behavior. As selected behaviors are typically based on areas in which the client struggles or has not yet experienced success, videos are produced through the use of “creative planning and editing” (Dowrick, 1997). Another form of video modeling is video feedforward. Video feedforward differs from self-modeling in that the goal is to produce a video that presents an image of the future rather than being based on previous performance (Dowrick, 1997). An example of this could include a student role-playing a future occupation. Peter Dowrick, PhD, a leading researcher in the area of video modeling, reports successful application in behavioral modification ranging from phobias, social adjustment, and communication to physical and academic skills (Dowrick, 1999).




Research shows that this strategy can be especially promising for children with ASD and older children with behavioral or emotional disabilities (Possell, 1999) who have a preference for visual learning and find television reinforcing (Graetz et al., 2006). Some children with pervasive developmental disorders show a preference for focusing on a video model more closely than they do a live model. Researchers note that these same individuals often spontaneously imitate actions and memorize and repeat dialogues seen on video and television. Video self-modeling is a way to utilize and harness this natural proclivity towards engagement with video to achieve behavioral and instructional objectives. Additional findings revealed that the technology was less intrusive than most behavioral interventions and was less time consuming for students.

Today's technology makes it easy to produce and edit videos. For instance, short video clips can be taken on digital cameras, transferred to a computer and edited on software that is available for free for Apple Macintosh and Windows-based computers. With these tools becoming readily available to teachers and therapists, video clips can be created without much time or cost. Video self-modeling strategies can be used to teach skills that range from the discrete tasks (i.e., drinking from a sippy cup) to more abstract behaviors (e.g., initiating social communication or appropriate behaviors to deal with triggers for tantrums).

Mineo, Ziegler, Gill and Salkin (2009) examine the potential of four types of electronic screen media to engage children with autism spectrum disorders. They studied levels of engagement with animated videos, videos of oneself (Self Videos), immersion in a virtual reality environment (Self VR), and videos of a familiar person immersed in a virtual reality environment (Other VR). They found that the participants were highly interested in all self-modeling conditions, with variations depending on engagement metrics used. This study lays the foundation for further research on the potential for video and self-modeling for engagement and learning for individuals with pervasive developmental disorders.

IN PRACTICE: "What Can You Be?"

In an effort to integrate basic filmmaking instruction with a therapeutic group, we initiated a program where students worked collaboratively to write, film, edit, and produce short films. For this initial trial, we divided twelve special education students into two groups of six at an intermediate school in Hawaii. The project was titled "What Can You Be?" and the fundamental goal for each student was to produce a one-minute film composed of three acts. In the first act, the students introduced themselves (by first name only) and stated one or two of their "Key Strengths." To help them identify and articulate what their strengths were, the students took the online VIA Strengths Survey for Children (Seligman, 2003) and used the results to determine a few Key Strengths. For the second act of their films, each student shared a talent or interest and we filmed them demonstrating or performing this activity. In the third act, the students pulled together their expression of their strengths, talents, and interests to answer the question, "What Can You Be?" These final two acts together created a video feedforward where students created a glimpse of a possible future.



By creating these videos, students went through a process of reflecting on both who they were and opening a discussion on a possible direction for future study or career paths. The resulting “self modeling” video served as a powerful tool, both in the process (making the video) and in the product (the outcome that students watched and shared with pride). The videos gave students the opportunity to create positive self-images, thereby increasing their sense of self-esteem and giving them some pathways for self-determination about goals they could articulate and reach.


To serve as a basic guide for this project, we developed a set of measureable therapeutic goals that included components related to film production. The focus of these goals was to incorporate the creative and physical process of film production with opportunities for therapeutic lessons and interventions. During group sessions, our ideal scenario was to create naturally occurring, real-life situations where social skills and strengths could be taught and practiced (*see case scenario and goal samples*).

Case Sample:

Scenario: While filming her story, a female student from one of our groups was experiencing anxiety, which was causing her to have difficulty both saying her lines and directing others. Recognizing this, the therapist pulled the student aside and helped guide the student to recognize that she was exhibiting signs of anxiety and stress. The therapist then offered different strategies that the student could use to help calm her. The student, who was typically resistant to trying stress reduction techniques during individual counseling, readily engaged in relaxing breathing exercises, was able to calm herself, and was able to successfully complete her filming. In this case, the student’s desire to have a “good” film motivated her to be willing to learn and practice a relaxation technique that she had previously refused to try.

Sample Goals:

1. Students will recognize personal strengths and differences in self and others through group discussion of the VIA Strength Survey results and film storyboard development that incorporates identified strengths.
2. Students will successfully incorporate the guided application of personal strengths into group participation and film making by evidence of successfully navigating the steps to producing a film (Story development, storyboard, assigning cast and crew, scouting and scheduling filming, securing releases, filming, editing, and showing/distribution).
3. Students will be self-directed in the application and evaluation of their strengths within a team environment, as evidenced by student-guided conflict resolution, student-led group and team discussion, and successful navigation of the steps to producing a film.
4. Students will develop goals to be considered for future “What Can You Be?” groups including peer mentoring and positive peer support.




The following include two case examples from our first “What Can You Be?” group. In the year following their participation in the film group, we witnessed the behavior and choices of two 12 year-old male students undergo transformation. This change appeared to be related to their watching themselves on film.

Case Examples:

- *Case One:* We worked with a student who was strongly opposed to being filmed or having his voice recorded, however, he was still interested in creating a film. The Key Strengths that he selected were “creativity” and “originality.” After some discussion and brainstorming, he decided that he would write “my name is…” and “my strengths are…” on the backs of his fingers and we would film his hands for the first act of his production. During the second act, we would film him playing “Iron Man” on his guitar, showing only his profile with the use of a backlit screen. The final act would again feature his fingers, this time, with the words “I can be a professional guitar player.” When the scheduled filming day arrived, our student decided that he was comfortable talking, but still wanted to appear only in silhouette. After completing a few takes of his intro and allowing him a chance to review the footage, he decided that he was okay with a partial shadow on his face instead of total blackout. A year later and after several repeated viewings of his production, including viewings in the presence of others, this student has purchased his own pocket video camera and has become a prolific amateur filmmaker, posting weekly additions on YouTube, featuring stories and real-life experiences where he and his friends are the stars of the films. He no longer experiences the same intensity of discomfort when speaking or acting in front of a camera and actively seeks out ways to improve his filmmaking skills.
- *Case Two:* We worked with another male student who was also identified as having poor social skills and low self-esteem. The Key Strengths that he selected were “curiosity and interest in the world” and “leadership.” The talent he chose to share was his ability to play ukulele and sing. In his closing act he stated, “I can be a musician.” During filming, this student displayed a calm confidence that the therapist had not seen during other sessions. A year and several viewings later, this student has taken on leadership roles at school including teaching ukulele to other students and expressing interest in talent shows. He is now eager to take responsibility for organizing film projects and shows continued confidence in front of the camera. When an opportunity came up for students to complete films for a film competition (on short notice), this student was 1 of the 3 students (out of a class of 15) who was able to meet the deadline and submit a film.

Topic: Anonymous Response and Feedback Systems and Therapy

Looking to strategies from the business world as a guide, many classrooms are turning to the use of anonymous response and feedback systems to increase student participation, engagement, and authenticity of responses. Until recently, the most widely used of these systems was composed of handheld devices that were linked (via Wifi or a radio signal) to a receiver, which would allow the presenter to analyze




and disseminate audience input through a computer and a projector. While these systems remain functionally sound, they often require expensive hardware and typically need to be set up by a professional. Due to technological advancements, web based polling systems have emerged that are reducing cost, simplifying use, and increasing mobility and accessibility. With these new systems, the only hardware requirements are a laptop and an audience with cell phones.

At an intermediate school in Hawaii, several math classrooms are participating in an on-going study using an anonymous response system provided by Texas Instruments to solicit answers to classroom questions, administer testing, and to facilitate group discussion. Teachers using the system are reporting a noticeable increase in both classroom participation and test scores. The classroom teachers report several advantages associated with using the new technology, including being able to address a wider variety of questions and perspectives because the system allows multiple student responses to be submitted simultaneously in real time. In addition, by using this technology teachers are better able to recognize and address errors on a class wide basis due to instant processing of student responses. As such, the teachers no longer have to rely on nodding heads to gauge classroom comprehension of lessons.

Adapting these strategies and findings to mental health care seems a natural progression. Until recently, technology and cost were often prohibitive to widespread application or acceptability among clients. However, the advancements in and increased use of cell phone technology and online applications have created a different culture of technology users. While the use of a handheld polling device might previously have been more of a foreign experience, it is rare to find a teenager or young adult who is not familiar with basic cell phone operation including text messaging. This societal wide increase in technology acceptance, understanding, and device operating skill makes the possibility of successfully using polling in therapy sessions much more plausible than in previous times.

Supporting research for the use of anonymous response in survey applications also offers promise and potential consideration for new trials in mental health. For example, findings from a study conducted at a southwestern university found that an anonymous response system could increase the reporting accuracy of college students being asked for information about sensitive or socially undesirable behavior (Saegert, Fractor, & Mandel, 1980). Additional findings indicated that the likelihood that participants would continue to answer honestly increased when they were able to see that other members were responding with approval on previous questions. With new polling systems allowing for instant posting of data, it is now possible for therapists and group members to work together and respond to postings as part of a therapeutic discussion.

In another study supporting the use of anonymous response, researchers reported that junior high school students tended to report less current drug use when submitting an identifiable survey when compared to a survey where their identity was protected (Malvin & Moskowitz, 1983). If our clients were provided this same opportunity to share anonymously in a therapeutic group format, it is possible that levels of disclosure would also increase.



Research on disclosure tells us that clients may refrain from sharing simply out of fear of how a therapist might respond (Dew, Morgan, Dowell, et al., 2007). For example, a client may be worried about being referred to a more intensive therapeutic setting. In one study measuring possible effects of feedback accountability on upward appraisal, researchers found that, when given a choice, subordinates preferred to give anonymous appraisals to their bosses to protect them from professional reprisal (Antonioni, 1994). What if similar concerns are more widespread than previously thought across the members of our therapeutic groups?

Much like the previous example from the business world, therapeutic groups can foster similar blocks to authentic communication. Differences in perception, social hierarchy, group trust, communication styles, personality preferences, and internal filters can drastically affect the ways that groups interact.

For teenagers participating in group therapy, barriers to disclosure can often include fear that others will see them unfavorably or that they might not fit in if they share their thoughts or emotions. All too often, group discussion is unbalanced; we have the ‘talkers’ and the ‘quiet ones.’ Could an anonymous response system help to level this playing field? At one of our practices, we are preparing to explore this question by introducing a response system into group therapy.


In Practice: Text Messaging and Group Therapy

At an intermediate school in Hawaii, group therapy members are being assigned an iPod Touch and using the online application *polleverywhere.com*, to input both solicited and spontaneous responses to group questions and discussion. Depending on the nature of the questions, the therapist has the option to post student responses in real time on an interactive white board, after they have been reviewed, or not at all.

In our experience we find it best to initially introduce the anonymous response system with practice sessions focused on teaching students practical use of the interface. Individual practice time is made available for students who need extra time to develop the tactile skills necessary to respond in a timely manner. During this time students are also provided with basic protocols such as waiting for a cue before submitting answers that will be publicly posted, not shouting out comments when responses are posted, and treating posted responses with the same level of respect and consideration that would be given to a spoken response.

As students become more proficient with the system, the therapist introduces polling style questions into a traditional group format. As student response time decreases, select opportunities are provided to submit unsolicited responses and reactions to the group process. Using the online application such as *polleverywhere.com*, the therapist is able to track and record responses from students.

To facilitate the additional volume of information during unsolicited responses, therapists work in teams including a lead therapist, who is responsible for group management, and a



co-therapist who uses a private viewing screen, to monitor responses and messages from group members.

Preliminary acceptability trials with college students, mental health professionals, and intermediate aged students have shown promise and have provided therapists with considerations for managing the group.

Topic: The Use of Interactive White Boards and Client-Generated Stories in Therapy

With computer technology and media software offering a wide variety of options for story telling and recording of stories, practitioners now have the ability to create and preserve client-generated stories, in real time, during group therapy sessions.

Allowing adolescent clients to analyze and solve problems through the use of their own stories can help foster a cooperative therapeutic environment in which youth are less likely to engage in power struggles with their therapist (Biever & McKenzie, 1995). When stories are created in a group setting this cooperative therapeutic and learning environment includes the therapist, the individual client, and other group members working toward a common goal – the successful conclusion of a given story. Ideally, within the context of a story, therapists are able to provide clients with a way to process and work through anxieties and defenses (Bovensiepen, 2002).

The technology behind this strategy is the interactive white board, which is replacing dry erase boards as a method for posting and collecting data and engaging clients. Material that was once generated and written on a board, only to be erased after the session time had ended, now can be preserved with programs that function in a similar fashion to Microsoft PowerPoint. With client input being preserved, often in the client's own handwriting, the therapist now has a reference point to return to during future group sessions. During initial trials at an intermediate school in Hawaii, we found students to be very receptive and adaptive to working with this new form of technology.

Through the use of the strategies below, client-generated stories can assist in producing a safe environment that encourages therapists to better understand and tap into the strengths of the adolescents in their groups - a key part of facilitating therapeutic conversations (Biever & McKenzie, 1995).

In Practice: Mapping Deployment for Military Dependents Using PowerPoint and Comic Life Software

In one of our practices, the counselors have created a group called "World Warriors." The group was composed of students in the 7th or 8th grade who had a primary caregiver on deployment. Each week, the students got together to offer and receive social support for the duration of the deployment. One of the primary goals and tasks of this group was to document the "journey" through the students' experience of deployment.

Microsoft PowerPoint and “Deployment Maps”:

“*Deployment Maps*” are PowerPoint slides created on and shared using an interactive white board that include questions used to track both the emotional and coping experiences of students while their family member was on deployment.


Typical questions included:

- What is something that you are excited about?
- What is something you are concerned about?
- Do you have personal news that you would like to share?
- What have you learned in the last week to help you deal with last week’s difficulties?
- Do you have any news from your deployed parent/guardian/family member that you would like to share?

At the beginning of each session, students were asked to post weekly updates to the questions on their map and to rate their stress level on a scale of 1-10 (“1” = low stress, “10” = high stress). If students rated their stress levels at 6 or higher, the group would work together to generate possible solutions and strategies that could either solve the problem or provide the individual member with additional support. These solutions and strategies would be added to the slide of the student in need. During the following week, the student who requested help would report back to the rest of the group on the outcome of using the various suggestions. If the student was unable to develop a suitable resolution, the group would work to generate more options and the process would repeat itself until an adequate solution was found.

Case Sample:

During an individual therapy session an 8th grade female student, whose father was on deployment, reported struggles with other family members. Specifically, she told the therapist that she and her sister had been fighting more and that her mother seemed more angry, more strict and demanding, and less supportive. Where the family used to participate in fun activities together, they now fought and spent little time together. At the encouragement of the therapist, this student agreed to post these concerns on her weekly map and then share these concerns with other group members. During the group session, members offered several suggestions, many of which were pulled from their own maps in previous weeks. They encouraged her to try and share her feelings and concerns with her mother and sibling. They recommended trying to be more patient, to understand that each person has different ways of dealing with the stress of having a deployed parent, and that offering extra help around the home might be a good way of supporting other family members. All of these suggestions were then posted on her map so that she could track both her difficulties and her strategies for addressing them. A week later this student reported that her mom was appreciative of her efforts and they were able to have a conversation about being sad and missing the father. One student came up with the idea to create family produced care packages as a way of bringing everyone together and doing something tangible to address their emotions.



As the student participants progressed through the various stages of deployment (week one, week two, etc.) they developed an on-going record of both experiences and solutions to various challenges they encountered. Students noted it was empowering to see how their suggestions, personal experiences, and coping abilities developed through their interactions with other group members.

“Comic Life” and the Storyboard Narrative:


Comic Life is another program that has been incorporated into the “World Warriors” deployment group. This program provides an easy-to use platform that students can use to build their own comic book pages. During group sessions, students used both external and onboard digital cameras to generate pictures of group members that represented various states, from onset to resolution, of a given problem. Students then uploaded these photos into the *Comic Life* application, chose various page templates, added speech balloons and captions, and built their own stories. Notably, for this activity, very little technical skill was required.

As a group, the participants used this software to create a variety of narratives to address concerns of group members. One of the significant strengths of using this format included allowing students to collaboratively approach problems from both first and third person perspectives when creating their pages.

Case Sample:

In one of our military deployment groups we worked with an 8th grade female student who rarely revealed anything personal in her PowerPoint slides. On any given week, her typical posted responses would be “nothing bothering me” or “stress level low.” According to her postings, her life was relatively under control and free of stress. During one group session that included her typical “everything is okay” posting on her map, she began complaining to other members about a disagreement she had with some peers. The problem, as described by this student, was that she believed her friends were talking behind her back. At this point the therapist suggested creating a story page outlining the problem and possible solutions. Using *Comic Life* software, the group members created a story about a fictitious character experiencing the same problem. They used digital cameras and took pictures of another student who would represent the ‘person with the problem’ in the story (*while the PowerPoint maps required a first person narrative, our comic narrative was typically being done in third person*). As our student continued filling in the ‘speech balloons’ and story boxes, a very detailed third person account of emotional suffering and frustration began to emerge. When the page was complete, other members offered several suggestions including peer mediation (program offered at the intermediate school where trained students facilitate conflict resolution), talking directly to her friends about her feelings, writing a letter to friends, or having another friend talk to the girls involved in the disagreement.

The therapist noted that students frequently were more willing to collaborate on group problem solving and discussion when creating third person comic narratives. More specifically, some of



the typically shy or quiet students often became increasingly willing to discuss problems or concerns when using the comic narrative as a means of therapeutic engagement.

Topic: Streamlining Data Collection

One methodological issue in mental health that is particularly daunting for large-scale studies is the efficiency and utility of data storage and collection procedures. This issue has long been a challenge in mental health research for a number of reasons and for which traditional, person-period data storage and analysis programs (e.g., SPSS) may not be sufficient.

First, psychological data is inherently complex. Often, the information gathered may include a combination of quantitative and qualitative variables. Such variables can be difficult to transform and analyze according to differential coding and the level of difficulty in statistical tests. Second, data security also is a concern in mental health studies, even for relatively small experimental designs (single-site or single-investigator). Third, there can be difficulty in managing and maintaining hard copy records of data. There are often a large number of research assistants, postdoctoral staff, and graduate students who need to access the database(s) and/or come in contact with the data in some fashion. Coordinating access to data while also ensuring appropriate record keeping are considerable challenges. All of this can lead to an infinite number of concerns and areas for consideration.


IN PRACTICE: Child STEPs Project and Data Collection

In an effort to overcome some of the typical data collection challenges of previous studies, researchers involved in The Child STEPs project (www.childsteps.org; Weisz, Chorpita, Duan, Glisson, Green, Hoagwood, et al., 2003) sought out programmers to help develop and design a unique data collection and management system. Specifically, researchers were interested in developing a database collection and storage system that could be managed via a web-based system, and also could be accessed at various levels through a password-protected, network/web interface design. The study used core programmers who were experts in the provision of active database websites. This system allowed individuals to enter, edit, and view data directly on a centralized server, as well as to interface with collected data across sites. This data collection and management system not only addressed the issue of data security, but also supported the sheer magnitude and complexity of the psychological data collected throughout the tenure of the project.

In addition to traditional data collection procedures, including keeping hard copies of treatment and supervision data, research assistants regularly updated the new web-based system. Treatment data included weekly mood ratings and supervision data related to the varying techniques therapists employed during a given week.

“The Dashboard”

The innovative piece of the web-based system was apparent when data needed to be either examined or analyzed. For example, clinically relevant data, such as weekly mood ratings and utilized treatment techniques garnered through the supervision process, were displayed via the



web-based database as a 'dashboard' (see Chorpita, 2007). Essentially, the dashboard displays treatment outcome data graphically, in order to be able to track treatment progress/decline over time. Relevant qualitative data that may be important for a given period of time also can be displayed, including utilized treatment techniques (i.e., did the therapist introduce relaxation techniques in last week's session as indicated by the supervision plan?). Further, the dashboard can be used to guide the training and supervision process of participating therapists, allow for real-time editing, and be viewed by participating investigators across the country.

Key Advantages for Data Management with Dashboard:


The dashboard is accessible prior to and during weekly conference calls between expert consultants and local supervisors, which then allows team members to review supervision data. This facilitates a cost effective way to increase the communication regarding cases by providing instant access to current case progression. Through this system, professionals are able to access up-to-date treatment outcome data to guide local supervisors in the training of their participating therapists. Objective data, such as weekly mood ratings, the presence or absence of specific techniques, and suggestions made by expert consultants can be made readily available, in real-time, to the research team.

Another advantage of utilizing this web-based data collection and storage system is the efficiency associated with extracting relevant subsets of data for analysis. Since the data is maintained via a web-based system, it becomes immediately available for download at local and distant sites. Investigators are then able to quickly examine a number of data collection and treatment outcome factors, such as recruitment, data flow, and summary reports. At any point, comparison statistics can easily be run in order to examine cross-site differences throughout the course of the project. Thus, issues related to the complexity of data are adequately addressed, as well as the efficiency in extracting this data.

Since on-line information storage capacities are near infinite, the magnitude of data is also addressed with the web-based system. Ultimately, this new database will allow researchers to act more efficiently by enabling them to have quick access to data and the tools to recognize an exponential number of relationships for observation and analysis.

Topic: Computer Assisted Interventions (CAI)

Computer assisted interventions are delivered via Internet, CD-ROM, DVD, floppy disk, computer hard drive, or other electronic device (Ruggiero et al., 2006). These interventions are becoming more widespread, particularly in community and school settings. A recent review of the literature on computerized cognitive-behavioral therapy programs revealed multiple promising outcomes, including: 1) symptom reduction; 2) favorable client satisfaction; 3) attrition comparable to standard cognitive-behavioral therapy; 4) reduced clinician time; 5) high cost-effectiveness; and, 6) ease of integration into community clinics (Green & Iverson, 2009).



For symptom reduction, there is preliminary support for these programs reducing symptoms associated with a variety of disorders, including depression, anxiety, bulimia nervosa, and risky health behaviors such as smoking and problem drinking (Green & Iverson, 2009). Potential advantages of computer assisted interventions include direct tailoring of the message or recommendations to diverse groups, easier collection of process and outcome data, ability to reach large groups of people at relatively low-cost, easy accessibility, and ability to update, refine, and expand programs as needed (Ruggiero et al., 2006).

IN PRACTICE: Computerized Cognitive Behavioral Therapy “Stressbusters”


Abeles and colleagues (2009) developed a computerized cognitive-behavior therapy program called “Stressbusters” for teenagers with mild to moderate depression. This interactive computer software program is a CD-ROM consisting of eight 30–45 minute Cognitive Behavioral Therapy (CBT) sessions designed for 12–16 year olds. Components of each session include an interactive multi-media presentation featuring audio narration synchronized with videos, animations, graphics and printouts. Users of the program are guided by a narrator and are allowed to repeat sessions whenever necessary. Program content and goals include: Introduction to the program and goal setting (Session 1); Getting activated (Session 2); Emotional recognition (Session 3); Noticing thoughts (Session 4); Thought challenging (Session 5); Problem solving (Session 6); Improving social skills (Session 7); and, Relapse prevention (Session 8). Participants watch a series of case vignettes of teenage actors who play the roles of depressed teenagers. Participants are able to hear about the teenager’s lives and watch them use the program in a combination of short video sequences, talking heads and voiceovers. Preliminary findings for Stressbusters indicate that this program is a valid and clinically effective form of cognitive behavioral therapy for adolescents with depression.

Topic: Multimedia Technology

Multimedia education technology has been defined as text, graphics, animation, sound, voice, music, still pictures, and motion video that are incorporated into a single system (Ferretti & Okolo, 1997). Multimedia technology has been used to improve the social skills of middle-school students with emotional disabilities (Cummings et al., 2008).

IN PRACTICE: Social Skills Through Media

Cummings and colleagues (2008) employed a multimedia technology-based intervention to improve the social skills for adolescents struggling with significant emotional problems. The social skills lessons were student-generated, but also included teacher facilitation. Social skills instruction was delivered to the students in their specialized classrooms during five 50-minute social skills training sessions each week. The instruction was based on the *Skillstreaming the Adolescent* program (Goldstein & McGinnis, 1997) and lessons were taught by the special



education teachers. Students received training in how to use a camera, how to transfer video from the camera to the computer, and how to edit their videos and save them to DVD's. The multimedia component of the intervention consisted of the students creating their own role-plays in triads and recording them with a camera (Cummings et al., 2008). The students then transferred the movie from the camera to the computer. Lastly, they edited their movies and transferred them to a DVD. As part of the intervention, students showed their social skills DVD to the class, which provided feedback on each performance. Following the DVD presentations, students were given a quiz on the skill. Results indicated that both interventions were effective in improving the students' social skills and their knowledge of social skills.



Section Three: Other Areas for Exploration and Implications

Distance Therapy

Distance therapy is a service delivery-method that employs various forms of technology to address the challenges associated with clients who frequently travel as well as rural and urban environments that have a shortage of professional counselors. The most common technologies associated with distance therapy are e-mail, Internet relay chat, text messaging, telephone, and videoconferencing, which enable the provision of psychological services via a live, interactive two-way video – audio system. Given the stigma of mental health, one potential advantage of using these technologies for adolescents is that they provide a more anonymous form of counseling that can effectively be delivered within a school setting. In addition, youth are clearly immersed in these technologies with reports revealing that large numbers of young people already use the Internet to communicate with others (Rosenbaum et al., 2000).


Cybercounseling and Avatars

Cybercounseling, or Webcounseling, utilizes electronic forms of communication via the Internet to allow for a counseling relationship between individuals at separate locations (Maples & Han, 2008). In their paper “Cybercounseling in the United States and South Korea,” authors Maples & Han (2008) noted an increase in both the provision and use of mental health services in South Korea following the availability of on-line counseling. They cited “anonymity” and “ease of access” (p.179) as key factors contributing to this phenomenon (Maples & Han, 2008).

Avatars are images, similar to buddy icons that are used to represent individuals during online chatting and on websites. Because some avatars allow for the expression of emotions (e.g., happiness, sadness, laughing), counselors may be able to work with children and adolescents on the recognition and expression of appropriate emotions.

Virtual Reality

Virtual reality is a technology that allows a user to interact with a computer-simulated environment, be it a real or imagined one. Similar to other technologies, the benefits of virtual reality include the ability to stimulate multimodal sensations and interactions that include visual, audio, and Haptic. Virtual reality programs are being used in the treatment of phobias, panic disorder, negative body image, attention deficit disorder in children, rehabilitation for traumatic brain injury, dementia, schizophrenia, and posttraumatic stress disorder (Gregg & Tarrier, 2007). This method of intervention is especially helpful for anxiety disorders as the client can be exposed to dangerous or fearful situations in a controlled, safe, cost-friendly, and engaging environment (Gregg & Tarrier, 2007).



Because youth are exposed to stimuli in controlled environments, the therapist is able to regulate the level of simulation, thus tailoring the intervention to the needs of the client. An additional benefit is that virtual reality systems can record the real-time behavior of youth, resulting in important empirical data that can be used for evaluation of the subject or effects of treatment. Furthermore, immediate feedback may be provided to the client in the virtual reality environment, which may result in increased client comfort and sense of self-efficacy (Gregg & Tarrier, 2007).

Haptic Technology

Haptic devices refer to technology that interfaces the user via the sense of touch by applying forces, vibrations, and/or motions to the user. Touch-based therapy has been demonstrated to be effective in the treatment related to autism, dementia, depression, and anxiety disorders (Vaucelle, Bonanni, & Ishii, 2009).

Siftables: (see siftables.com)

“Siftables are cookie-sized computers with motion sensing, neighbor detection, graphical display, and wireless communication. They act in concert to form a single interface: users physically manipulate them - piling, grouping, sorting - to interact with digital information and media. Siftables provides a new platform on which to implement tangible, visual and mobile applications” (Siftables.com, 2008)

Siftables represent a very intriguing expansion of haptic technology. Their design allows users to interact with digital media in a more intuitive way. Blocks can simulate paint being poured and mixed as if the user was actually transferring liquid. By simply repositioning the Siftables, the user can interact with patterns, tools, and sequences.

Mental health professionals could use the interactive sequencing ability of these blocks to help clients explore cause and effect in CBT.



Section Four: Implications of Technology

Benefits of technology

Employing new technology as a method of counseling service delivery in the school-based setting, either as the primary counseling method or as a supplement to traditional mental health counseling, offers several prominent benefits that include:

Engaging and Motivating Youth to Participate in Treatment

In our practices, there has been an undeniable positive correlation between the introduction of technological tools and media and student engagement. Whether it is the use of the Texas Instrument system in math or Ipod touches during group therapy, technology has the potential to meet kids where they are and with the communication tools they are using.


Increased Resources

The Internet can serve as a primary resource for students to access psychoeducational mental health information. For example, one study found that almost one-quarter of adolescents ages 15-24 accessed the internet for information about depression (23%), while similar percentages were found for accessing information about violence and problems with drugs and alcohol (Rideout, 2001). Counselors can help students learn how to effectively search for relevant and valid mental health information that will likely result in increased knowledge for students about mental health issues.

In addition, clinicians with restrictive budgets and parents can often rely on media and gaming as a valuable and renewable resource in contingency management programs.

Delivery to underserved populations

With less than one-third of children suffering from depression receiving treatment in the United States, many rural communities are looking to telemedicine to address provider shortages (Nelson et al., 2006). Marcin et al., (2004) point out that these shortages of highly trained practitioners in rural areas are creating an imbalance in mental health care for these communities when compared to urban and suburban areas. In many of these rural or urban schools in which the demand for counseling exceeds the available service providers, distance technology can help provide counseling and psychiatric services for these underserved individuals. Given that access to child and adolescent psychiatrists is especially challenging, telepsychiatry may prove particularly valuable not only in providing services to clients, but in reducing “provider isolation” (p. 5), increasing training opportunities for local care givers, reducing the potential for provider error, and decreasing time spent away from work or school for both the client and family members (Marcin et al., 2004).



Convenience and Efficiency

Counselors in large schools are frequently overwhelmed by the number of students on their caseload. Computerized interventions may allow for the provision of services to groups of students without placing an undue burden on the counselor. In addition, interventions that use technology (e.g., text messaging, internet therapy) are convenient and efficient because services can be provided outside of normal business hours and to different locations.

Decreasing Stigma

Building in opportunities for anonymous and remote provision of services opens up the possibility for increased patient privacy. Through the use of media and technology driven strategies such as film and video self-modeling, students learn therapeutic lessons during a highly desirable activity. At one of our practices, students participating in media driven therapy often choose to share their media creations with peers. Many of these students request permission to work on special projects outside of the therapy setting, creating further opportunity for social and team skill building.

Criticisms, Challenges, and Ethical Considerations of Technology

As described earlier, there are multiple advantages to utilizing technology as a method of counseling service delivery in the school setting. At this time, however, folding technology into evidence-based practice is challenging because the overwhelming majority of interventions that utilize technology as a component of psychological interventions have not been systematically evaluated as “evidence-based”. Indeed, many school-based psychological and behavioral interventions, including those that do not incorporate technology, have failed to undergo rigorous and systematic evaluation.

This means that many mental health interventions being utilized in the schools were originally developed in university research settings (Weisz, Donenberg, Han, & Weiss, 1995) and may not result in the same positive outcomes. As such, one of the initial considerations for practitioners in the schools deciding which interventions may be appropriate is the issue of transportability (Graczyk, Domitrovich, & Zins, 2003). In other words, will an intervention developed in another setting (with or without the addition of technology) still demonstrate reasonable efficacy and safety when implemented in a school setting? The issue of transportability of interventions that utilize technology may be even more complex depending on the availability, or lack thereof, of appropriate resources (e.g., computers, VCR’s, internet) at the school.

Soliciting feedback from other practitioners with experience implementing the intervention that incorporates technology will be important to prepare for likely obstacles. Using results from pilot studies conducted in the school also may provide useful information about the efficacy



and safety of the intervention, and the feasibility of implementation on a larger scale.

Funding and finances are ever-present issues when discussing school-based mental health services, and also may prove to be a significant obstacle when trying to mesh technology with evidence-based practice. In some cases, funding may not be available to train and support personnel in the implementation of the psychological interventions that utilize technology. In an attempt to overcome this obstacle, it has been suggested that schools provide mental health professionals with more opportunities to attend professional training workshops that deliver training on implementing evidence-based practice, as well as provide supervision for implementing the interventions (Crisp, Gudmundsen, & Shirk, 2006). An additional obstacle is that no established state or federal standards exist regarding billing and reimbursement for psychological interventions delivered in conjunction with technology. Contractual relationships with the school district may help reduce the reliance on billable services. Federal, state, local, or private foundation funding also may help offset the cost of provision of services.

Lastly, as with any technology, technical difficulties can happen. When these difficulties arise, it is paramount that the counselor and the school have an alternative plan in place to assist the students still in need of counseling. Procedures also need to be developed for instances in which students threaten to hurt themselves or others. It also is important that counselors address ethical issues such as obtaining informed consent from both parent and child (Childress, 2000).



Conclusion:

“Digital wisdom is exhibited both in a considered use of digital enhancements to complement innate abilities and in the use of enhancements to facilitate wiser decision making. In an unimaginably complex future, the unenhanced person, however wise, will not have the tools of wisdom that will be available to even the least wise enhanced human.” Prensky, 2009

Modern technology provides exciting and creative avenues for delivering psychoeducation, symptom assessments, and evidence-based psychological prevention and intervention programs to children and adolescents in multiple settings, including the school setting. In fact, youth may prefer computer-assisted assessments or interventions, as opposed to the traditional face-to-face sessions. Indeed, children and adolescents commonly report positive impressions of technology particularly because the multisensory approaches associated with technology deliver highly visual and interactive lessons that are engaging and fun.

The use of a multimedia approach may also result in increased motivation for behavioral change among children and adolescents because of the novel and entertaining aspect nature of the technology. For practitioners, employing new technology may help counselors overcome challenges associated with efficiently and adequately servicing high caseloads. The use of modern technology may also help counselors engage adolescents in the therapeutic process.

It is also important to note the distinction between technologies that are an additive to therapy with a clinician and those that may serve as the primary mechanism for delivery of services. While technology being used to supplement traditional EBPs may not have an effect on billing practices, technology interventions such as online CBT programs may raise the need to establish a different billing standard for portions of therapy.


While this white paper discusses several different methods to incorporate media and technology into practice, we emphasize that these are only tools that are part of a larger picture. That larger picture is about therapists and clinicians developing and delivering EBPs that unite with novel and innovative approaches to engage and build positive outcomes for our clients. Whatever the new and novel methods may be, they must also include consideration for effective dissemination and program packaging with the goal of encouraging client and therapist buy-in.

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