The Role of Instructional Design and Technology in the Dissemination of Empirically-Supported, Manual Based Therapies

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Abstract

The principles, processes and tools of Instructional Design and Technology (IDT) can be used to effectively migrate the content of empirically-supported Manual-Based Therapies (MBTs) from paper-based, text-intensive manuals to media-rich, interactive, web-based training applications. This paper outlines available technology-based mechanisms for delivering instructional content, provides examples of how each can be used for effective dissemination of MBTs, and outlines the advantages that may accrue from this approach. Clinical researchers and IDT professionals can collaborate to increase adoption of treatment manuals by employing user-friendly, instructionally-sound web applications that incorporate video role plays, audio narration, graphics, animation, and dynamic, interactive content.

Key words: manual-based therapy, dissemination, empirically-supported treatments, instructional design and technology, web-based training.

The principles, processes and tools of Instructional Design and Technology (IDT, Dempsey, & Reiser, 2002) can be used to effectively disseminate the content of empirically-supported, Manual-Based Therapies (MBTs). To maintain clarity of focus on the potential contribution of IDT there are two key assumptions: (1) that the dissemination of empirically-based psychological therapies is desirable, and (2) MBTs that have some evidence of clinical efficacy constitute the best initial candidates for dissemination. Although these assumptions are debatable (see Carroll & Nuro, 2002; Hayes, 2002), and entail some implicit and explicit assumptions of their own (Addis & Waltz, 2002), they are defensible and consistent with the market forces that continue to exert pressure on psychotherapists to deliver treatments with some evidence of empirical support (Craighead & Craighead, 1998). Given these assumptions, the major question is not whether treatment manuals should be used as a vehicle for disseminating empirically supported therapies, but rather how we can make treatment manuals better and more effective for use in clinical practice. It is the role of IDT in addressing this question that constitutes the focus of this paper.

Although the application of IDT principles, tools and processes to the dissemination of empirically-supported psychological therapies is in an early stage, the technologies and processes outlined in this paper are not mere speculation or science fiction. Some of the mechanisms and applications that I will describe certainly are on the technological cutting edge. However, each is grounded in the practical application of existing forms of instructional technology, and represents the logical extension of a little-known, but firmly established, field of study that traces its roots back to behaviorism and systems theory.

The overall organization of this article is as follows. I begin with a brief review of the Manual-Based Therapy literature and an introduction to the science and practice of Instructional Design and Technology. Next, the different types of technology-based mechanisms available for delivery of instructional content are discussed, and examples of how each can be used in the dissemination of empirically-supported MBTs are provided. Six major advantages that may result from the migration of MBT content from paper-based manuals to technology-based delivery mechanisms are offered and the

paper concludes with some thoughts about future directions in the design, development, implementation and evaluation of empirically-supported psychotherapies and other research products.

History of Manual-Based Therapies

The value of empirically-supported manual-based therapies (MBTs) has been the topic of vigorous debate since the first psychotherapy manuals emerged in the 1960's (Lambert, 1998; Lambert & Ogles, 1988). Proponents argue that MBTs allow practitioners to capitalize on the superiority of actuarial or statistical prediction over clinical judgment, make it easier to train and supervise therapists in specific clinical techniques and strategies, and focus and time-limit therapy more than might otherwise be the case (Wilson, 1996, 1998). Opponents, on the other hand, contend that widespread implementation of MBT protocols will compromise therapist flexibility, replace clinical judgment, reify therapy in a fixed and stagnant fashion, ignore important common therapeutic factors, and generally be impractical and inappropriate for use in clinics where therapists of diverse experience, background and training treat clients with multiple and diverse presenting problems (Carroll & Nuro, 2002; see also Kendall, 1998).

MBTs initially were developed by psychotherapy researchers who needed to specify and standardize their interventions (Luborsky & DeRubeis, 1984). As such, their primary purpose was to ensure internal validity, and their primary role was an evaluative one. By training therapists to adhere to, and demonstrate competency in, the faithful delivery of a manualized treatment protocol in the context of a randomized clinical trial, researchers were able to move beyond the question of "Does psychotherapy work?" and to address more specific, applied questions, such as "Which treatments work?", "Why do they work?", and "For what type of clients or problems are they best suited?" (Addis, 1997). The widespread use of treatment manuals to specify, standardize and differentiate therapies in efficacy trials was described as a "minor revolution" (Luborsky & DeRubeis, 1984) that facilitated the rapid development of standardized protocols for the treatment of a wide variety of disorders, ranging from Panic Disorder and Agoraphobia (Turovsky & Barlow, 1995) to Bulimia Nervosa (Wilson, 1997).

In recent years, MBTs have been asked to perform an increasingly ambitious and qualitatively different role from that which they have historically fulfilled. As capitated managed care systems began to pressure clinicians to deliver more evidence-based mental health services, they turned to the "empirically

supported" MBT protocols that had been used to train research therapists. Because these protocols constitute psychology's closest approximation to genuine "evidence-based treatment" some psychologists suggested that front-line clinicians follow these protocols in their daily practice (Strosahl, 1998). This fundamental shift effectively expanded the role of MBT from one of *evaluation* in the context of tightly controlled clinical trials to one of widespread *dissemination* in diverse clinical practice settings (Addis, 1997). With this shift, the debate surrounding their use intensified (see Carroll & Nuro, 2002; Kazdin, 1998). The very structure and control that made MBTs effective vehicles for evaluation became their most frequently criticized characteristics (Beutler, 2002).

Introduction to Instructional Design and Technology

There is an entire field of study devoted to the use of technology to accomplish instructional goals. Whether such goals involve improving physicians' confidence in addressing domestic violence (Harris, Kutob, Suprenant, Maiuro & Delate, 2002), or integrating specific case-information with medical encyclopedias, digital libraries, and databases (Singer, Riedel, & Levin, 1999), IDT provides a systematic process of applying human and media resources to efficiently accomplish them. This field concentrates not only on the application of technology such as computer or web-based training, per se, but "…encompasses the analysis of learning and performance problems, and the design, development, implementation and management of instructional and non-instructional processes and resources intended to improve learning and performance in a variety of settings…" (Reiser, 2002). In other words, IDT is a process that typically includes assessment of learning needs, design and production of instruction, and follow-up evaluation of results. Contrary to popular misconception, the development of a technology-based delivery mechanism (such as a web-based training course) is but one aspect of a much larger systematic process.

In fact, the origins of the Instructional Design field predate the Internet and even modern computers. Although the exact origins of the Instructional Design process are unclear, the writings of (Silvern, 1965) represent an early attempt to apply general systems theory and systems analysis to create effective and efficient aerospace and military training (Gustafson & Branch, 2002). By the early 1970's IDT methods had become common in all branches of the military (Branson, 1975) and had started

to appear in industrial and commercial training applications. Today, IDT is the accepted standard training methodology for large organizations in both the public and private sectors.

Interestingly, most early theorists in this area (including Silvern) were behaviorists (Burton, Moore & Magliaro, 1996). In keeping with the psychological zeitgeist of the 1970's, these early theorists believed that a wide variety of behaviors can be observed, measured, planned for and evaluated in ways that are reasonably reliable and valid. As such, they posited that the challenges of training and performance improvement, much like other types of behavioral change, can best be addressed by conducting an objective analysis of how systemic components are observed to interact, recording these observations, and then coordinating efforts to shift them in the desired direction.

The wide variety of instructional design process models described in the literature (e.g. Dick & Carey, 1996; Gagne', Briggs, & Wager, 1992; Kemp, Morrison & Ross, 1998) share the core elements of analysis, design, development, implementation and evaluation (or "ADDIE", as it is commonly referred to, see Figure 1). **Analysis** is a multifaceted process that typically includes inquiry about the *audience* (Who are the learners? How many are there? What level of training and experience do they have? How technologically literate are they?), the *goals* of the training (What is the training designed to accomplish? Will the training teach cognitive, psychomotor or affective objectives?) and the *context* in which the training will occur (What is the technological infrastructure? What human and budgetary resources are available?)

The **design** phase begins with writing objective, measurable Student Performance Objectives or SPOs. An SPO is a statement of observable behavior or performance on the part of the learner that typically prescribes a minimally acceptable, measurable standard (e.g., quantity, quality, efficiency, durability) and the conditions under which learned behavior or performance is to occur (Vogler, 1991). An example might be: "After completing this training, the learner will be able to accurately identify and label three different cognitive distortions evident in a video-based case study example." Once the SPOs have been identified, the instructional designer specifies the learning activities associated with each objective and the media or delivery mechanism by which the audience will receive the instruction .

Development refers to the construction of the instructional materials. For a traditional instructor-led classroom course, this might involve writing an instructor's guide and an accompanying student

workbook. For a videotaped distance learning course, the development phase would involve writing the script, hiring actors, finding a location, shooting the video, editing and post-production. For a self-paced, online course, the development phase would involve using a web authoring tool (a software environment, such as Macromedia Dreamweaver ™or Authorware™) to assemble the individual graphic and textual elements that together will form the course.

As the name implies, the **implementation** phase refers to the process of putting the instruction into practical effect. For a traditional lecture-based course, implementation would occur when the class is actually held. For courses delivered online, implementation occurs when the content is posted on a system called a Learning Management System (LMS). An LMS is a software system that provides an interface between the learner and training professionals that launches and tracks courses, handles the course catalog and registration, records course status and completion and records scores for testing and certification (Rosenberg, 2001).

The ID process incorporates a formative and summative **evaluation** phase that assesses the degree to which the training accomplished its stated goals. In the training and development literature, evaluation is typically conceptualized in the context of a model proposed by Donald Kirkpatrick (Kirkpatrick, 1959a, 1959b, 1960a, 1960b). In the Kirkpatrick Model, *Level 1* evaluation measures learners' reactions to the material, *Level 2* measures the degree to which new learning has taken place, *Level 3* measures the extent to which learners are able to transfer newly acquired knowledge and skills into on-the-job performance, and *Level 4* measures the impact that these performance improvements have on the bottom line (in our case, client-level and mental health care system-level outcomes). The reader who is interested in more comprehensive discussion of Instructional Design model is referred to (Dick & Carey, 1996) who have developed what is perhaps the best-known and most widely used contemporary ID model.

The Role of Instructional Design and Technology in the Dissemination of Empirically-Supported Psychological Therapies

The use of empirically-supported, manual-driven psychological therapies to change clinical practice can be viewed, at least partially, as an instructional challenge. The instructional goal is convey

new clinical approaches, strategies and techniques in a way that is easy to learn, easy to use and easy to understand. IDT provides a structured process to analyze the specific needs of a target clinical audience, design and develop effective, relevant instructional content, and deliver it using technology-based mechanisms that are interactive, media-rich and engaging. In so doing, IDT has great potential for *effective dissemination* of MBTs. Effective dissemination goes beyond simple diffusion of information to encompass the process by which target groups become aware of, assimilate, accept and adopt the disseminated information (Van Arminge & Shannon, 1992).

Technology-Based Mechanisms for Disseminating Psychological Interventions

The idea of using a technology-based platform for disseminating psychological interventions is certainly not a new one. For example, Greist and colleagues have spent many years developing and empirically validating a Cognitive-Behavioral Treatment for Depression that is delivered via Interactive Voice Response (IVR) technology over a standard touch-tone telephone (Selmi, Klein, Greist, Sorrell, & Erdman, 1990). More recently, Greist and colleagues have been exploring the role of a similar IVR platform in delivering behavior therapy for Obsessive Compulsive Disorder (Greist, Marks, Baer, Kobak, Wenzel, Hirsch, Mantle & Clary, 2002). Rothbaum, Hodges, and colleagues have been investigating the role of a very different technology platform in the treatment of anxiety disorders. Their work has involved the use of Virtual Reality as a mechanism for providing exposure therapy. To date, they have investigated the role of Virtual Reality in the treatment of acrophobia (Rothbaum, Hodges, Kooper, Opdyke, Williford & North, 1995), fear of flying (Rothbaum, Hodges, Smith, Lee, & Price, 2000), and Post Traumatic Stress Disorder (Rothbaum, Hodges, Ready, Graap, & Alarcon, 2001). Newman, Consoli & Taylor (1999) have explored yet another application of technology for the treatment of anxiety disorders: the use palmtop computer programs for the treatment of anxiety disorders.

In the realm of clinical training, investigators have examined the role of videotape in providing novice therapists with expert modeling and feedback regarding individual therapy skills (Baum, & Gray, 1992), in demonstrating differential approaches to marital and family therapy (Fine & McIntosh, 1986), and in identifying the ways in which video products can enhance the training of group therapists (Brabender, 2002). In fact, the use of audio and videotape to facilitate supervision and training has

become a common feature of many clinical psychology training programs, and is an important mechanism for rating therapist adherence and competence in psychotherapy outcomes research.

Each of these mechanisms would constitute what training and development professionals refer to as “e-Learning”. Because the terminology used to describe “e-Learning” it is often unclear, redundant and confusing, the reader is referred to the American Society of Training and Development (ASTD) website, where they can find an up-to-date glossary of e-Learning terminology (http://www.learningcircuits.org/glossary.html) . Briefly, ASTD defines e-Learning as a field that covers a wide set of applications and processes, such as Web-Based Training, computer-based learning, virtual classrooms, and digital collaboration. This definition subsumes the delivery of content via all electronic media, including the Internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, and CD-ROM (Kaplan-Leiserson, 2003).

Available mechanisms for the delivery of instructional content can be categorized as they relate to *time* (i.e., Does the instructor deliver the content at the same time that the learner receives it?), and *place* (i.e., Are the instructor and learner both present at the same physical location when the instruction is delivered?). Figure 2 depicts how the four major categories of delivery mechanisms relate in terms of time and place. This model has a clear place for traditional content delivery mechanisms, such as a face-to-face classroom instruction and supervision (Quadrant A), and libraries (Quadrant B), as well as more recent technology-based delivery systems such as videoconferencing (Quadrant C), audio and videotape (Quadrant D), and Computer-Based Training (also Quadrant D).

Although many types of delivery mechanisms could conceivably be used for the dissemination of empirically supported, manual-driven therapies, this paper focuses primarily on the potential role of two e-Learning platforms that capitalize on the many advantages of the Word Wide Web; Asynchronous Web-Based Training, and Synchronous Web Conferencing or Synchronous Virtual Classrooms.

Asynchronous e-learning: Web Based Training

Asynchronous means occurring at a different time. This category of delivery mechanism describes a learning event in which people cannot communicate without time delay. Some relatively mundane examples of asynchronous e-learning include online bulletin boards, list serves and email

exchanges, whereby a learner and an instructor can exchange information, ask and answer questions, submit and review assignments, exchange draft documents, and the like.

The form of asynchronous e-Learning that has the most potential for effectively disseminating empirically-supported MBTs is media-rich, engaging and interactive *Web-Based Training (WBT*). A WBT is a self-paced, online course created by an instructional design team, variously consisting of a project manager, an instructional designer, a content developer, a graphic artist, a multimedia producer, a web developer, a systems designer and a subject matter expert (Lee & Owens, 2000). Within a WBT, content can be presented in the form of static text (Hyper Text Mark-up Language or HTML), high resolution graphics, animated sequences, streaming video and audio narration. Essentially any media format that is supported by a web browser can be embedded in a WBT course as a means of delivering instructional content. In addition to delivering instructional content, WBTs provide opportunities for the learner to interact with that content, and can be programmed so that the learner's choices and responses determine the course of future learning activities.

For example, our research team has recently begun working on the design and development of a WBT course based on a National Institute on Drug Abuse treatment manual, entitled "A Cognitive-Behavioral Approach: Treating Cocaine Addiction" (Carroll, 1998) The paper-based manual can be downloaded from http://www.nida.nih.gov/TXManuals/CBT/CBT1.html. We have applied for funding from NIDA to translate the content from this traditional MBT into a series of interactive, media-rich, web-based modules for clinician training. Readers are invited to preview a prototype module on the topic of "Coping with Craving", which can be found at www.nidatoolbox.org.

This WBT will ultimately utilize a variety of media and mechanisms for delivering the necessary instruction. We intend to communicate the majority of content via text and streaming video clips of a therapist demonstrating the target strategies and techniques. Conceptual points will be illustrated using graphics and animated sequences. Handouts for monitoring relapse triggers and pocket cards summarizing effective coping strategies will be available so that therapists and clients can easily download them and print them out. In addition, we intend to give learners the ability to post comments and questions to bulletin boards, thereby providing a forum in which to discuss the challenges of implementing the protocol in their individual practice settings. We are also considering building an "ask

the expert" function that will allow learners to submit email questions to clinicians who have expertise in delivering this particular MBT. The variety of ways in which these media and mechanisms can be combined and applied to achieve instructional goals is limited only by the skill and creativity of the project team.

In keeping with good design principles, our WBT presents the content in a self-paced fashion that maximizes learner control (Driscoll, 1998; Horton, 1999; Lee & Owens, 2000). The learner can access the course material anywhere that they have access to an Internet connection, and can start, stop and resume taking the course whenever it is convenient for them to do so. The learner can also quickly and easily move freely between, and within, content modules. By providing the learner with ample opportunity to interact with the material through a variety of exercises, we hope to promote depth of information processing (c.f. Craik & Lockhart, 1972). For example, our WBT will include interactive exercises that provide counselors with the opportunity to help a hypothetical client identify and label his or her individual relapse triggers, and to detect his or her automatic thoughts related to the subjective experience of craving.

Synchronous e-Learning: Web Conferencing and Virtual Classrooms

"Synchronous e-Learning" is a term describing a real-time, instructor-led, learning event in which the instructor and all learners are logged on at the same time and communicate directly with each other, but are not physically present at the same location. The most common form of synchronous e-Learning is the telephone conference call. All of the callers are "on the line" at the same time, listening to a facilitator and communicating with one another. A more technologically sophisticated form of synchronous e-Learning is referred to as a *virtual classroom* or *web-conference*. Companies such as Placeware™ WebEx™, Centra ™, Interwise ™ and Hewlett-Packard™, have made rapid progress in developing this type of platform in recent years. Virtual classroom or web-conferencing platforms typically include such features as bi-directional audio and video streaming (so the audience and instructor can see and hear each other), a virtual whiteboard to enable real-time illustrations, online surveys, tests or polls that can provide instant feedback about performance, and the ability to share websites, PowerPoint slides, software applications, and digital video clips with the audience. Almost anything that is available on the web can be shared and discussed using synchronous e-Learning platforms. Videoconferencing and two

way live satellite broadcasts of lectures to learners in a classroom are other forms of synchronous e-Learning.

Evidence for the effectiveness of e-Learning

To date, there are no published reports of methodologically rigorous studies evaluating the efficacy or effectiveness of IDT for the dissemination of empirically-supported, Manual-Based Therapies. However, there is a fairly extensive literature in the field of education which suggests that technology-delivered instruction can be as effective as face-to-face instruction. In one oft-cited book, (Russell, 1999) reports the results of his review of 355 studies published between 1928 and 1998, and concludes that there is "no significant difference" between distance education and traditional instruction. The book's contents are regularly updated and available online at http://teleeducation.nb.ca/nosignificantdifference.

The more recent studies of the type that Russell reviews (e.g. Carey, 2001; Johnson, Aragon, Shaik, & Palma-Rivas, 2000) typically present identical content via an e-Learning format (e.g. asynchronous WBT or interactive video) and a synchronous face-to-face classroom. Following the completion of the course, researchers compare student outcomes including; (1) measures of student performance such as test scores and grades, (2) student attitudes about learning, and (3) overall student satisfaction. Unfortunately, much of this literature is characterized by a variety of methodological shortcomings, including lack of control for extraneous variables, lack of random selection of subjects, and of random assignment of subjects to conditions, and use of outcome measures without demonstrated validity and reliability (IHEP, 1999).

Despite the relative lack of methodologically rigorous outcomes data regarding the efficacy of e-Learning, the use of e-Learning to deliver instructional content continues to increase exponentially. Since 1995, rapid advances in computer and other digital technology, as well as the Internet, have led to a rapidly increasing use of these mechanisms for delivering instruction, particularly in training in business and industry (Reiser, 2002). Based on a questionnaire that was recently administered to respondents from over 550 organizations in 42 countries, the American Society for Training and Development reports that the percentage of corporate training content delivered via learning technologies increased from 8.8% to 9.7% between 1997 and 2000 (ASTD, 2002). The use of e-Learning continues to increase in higher education as well. Between the 1994-95 and the 1997-98 academic years, enrollments in distance

learning courses in higher education institutions in the US nearly doubled, with 78% of public four-year institutions offering such courses in 1998 (Lewis, Snow, Farris, Levin & Greene, 1999). Even in the government sector, delivering certain types of training via e-Learning has become more of the rule than the exception. In one of the largest e-Learning projects ever, the federal government launched an e-training Web portal in June 2002 that lets 1.8 million employees access IT and management courses via the Internet from their home or office computers (George, 2002).

Although the academic literature in education and psychology cannot currently provide us with the type of efficacy data that we would ideally like to have in hand before we begin experimenting with e-Learning applications for clinical training, the rapid and widespread adoption of these technologies across such varied audiences and subject matter areas strongly suggests that these technologies may be effective mechanisms for delivering training in our field as well. Given that the tools currently available for the development and delivery of e-Learning applications are powerful, relatively inexpensive, and increasingly easy-to-use, the cost of conducting initial pilot work in this area is extremely low relative to the potential benefit for our profession and for our clients. The following section outlines some of the reasons why pilot studies in this area might be particularly fruitful.

Manual Based Therapies are particularly well-suited for development as interactive, media-rich Web Based Training

Particularly for the more structured and concrete MBTs, the authors of existing paper-based manuals have completed many of the initial Instructional Design tasks that are required to migrate the content into Web-Based Training format. Lengthy, complex treatments are broken down into manageable modules, strategies and techniques are spelled out in step-by-step fashion, session-by-session guidelines are given, and technical and theoretical jargon has been minimized.

The critical tasks that remain are to take the content from the hard copy manual and translate it into a user-friendly, engaging, interactive web application. If done well, this process involves much more than converting the manual's content in HTML format and posting it on the web. Unfortunately, many WBT developers take this easy route, which usually results in text-intensive "page-turners" that save on printing costs, but do nothing to engage learners or facilitate their interaction with the material. In

contrast, a well-designed WBT involves an extensive amount of pre-production instructional design work before the content is ready for web development (Lee & Owens, 2000).

The pre-production process typically begins with the creation of a storyboard, which is a document that depicts the information that will be presented on each screen, including the text, the screen layout, ideas for still graphics, video and animation sequences and a script for audio narration. The storyboard serves as the blueprint though which the instructional designer(s) communicate the essential features of the WBT to the developers responsible for writing the actual code. Because any substantial departure from the original MBT content might undermine its existing empirical support, the pre-production process should also include iterative review of the storyboards by subject matter experts. IDT professionals speak of "migrating" content from one format to another, for example, from a paper-based MBT to a set of WBT modules. As a check on this migration process, a Subject Matter Expert (ideally the author of the original MBT) should review each storyboard and compare it with the paper-based manual content to ensure that the web-based module will be a high-fidelity replication of the original. Upon completing development of the WBT, and conducting a trial that demonstrates it to be as efficacious as the original MBT, the paper-based manual could then serve as a reference, or as an alternate form of delivery for those who lack access to the appropriate technology platform.

A comprehensive description of the Instructional Design, Development and Implementation process for WBTs is beyond the scope of this article. Consequently, the interested reader is referred to (Driscoll, 1998; Hall, 1997; and Horton, 1999). The important point is that MBTs, by their very nature, serve as an uncommonly efficient starting point for the IDT process.

Web-Based Training has many advantages over traditional text-intensive treatment manuals

Not only is the transition from paper-based manual to ID storyboard a fairly easy one to make, it also entails many important advantages. Such advantages, include: (1) User-friendly design can improve acceptance and adoption by practicing clinicians and students. (2) Dynamic interactive instructional design and web development can improve learner engagement with the instructional content. (3) Information can be presented in a case-based format that provides a realistic clinical context. (4) Hypotheses regarding eclectic versus rule-based implementation of manualized therapy protocols can be

tested. (5) Content that is developed for one online course can be reused. (6) Client self-study materials can be integrated with therapist training.

(1) User-friendly design can improve acceptance and adoption

IDT processes and tools can be applied readily to existing MBTs in order to make them more *user-friendly*. This issue is one (and perhaps the only one!) on which there is consensus among psychotherapy researchers, practicing clinicians, and experts in technology transfer. Everyone agrees that *MBTs need to become more* "*user-friendly*" (Carroll & Nuro, 2002; Craighead & Craighead, 1998; Hayes, 2002; Kendall, 1998; Strosahl, Hayes, Bergan, & Romano, 1998). This means that they must be easier to learn, easier to use, and easier to understand, especially for people who are not already experts in the content area. IDT provides the processes and tools to move MBTs beyond static paper-based manuals, and into the realm of technology-enabled, interactive learning experiences. These experiences can incorporate all of the latest web technologies (video, audio, graphics, animation) to make learning about a new clinical technique or strategy engaging and enjoyable. Such user-friendly training may well increase the rate at which clinicians choose to expose themselves to new information, and may ultimately increase the likelihood that clinicians accept and adopt the empirically-supported strategies or techniques being taught.

(2) Dynamic, interactive design can improve learner engagement

Moving MBT content into web-based format allows designers to create opportunities for the learners to interact with the content. Rather than the passive, unidirectional transfer of knowledge that occurs when reading a book or a text-intensive, online "page-turner", more sophisticated web applications provide a variety of means whereby the learner can act upon the content, and such actions can determine the course of future learning activities. Authoring environments, such as the CourseBuilder ™ extension to Macromedia's Dreamweaver ™ development platform, allows instructional designers and developers to present the learner with engaging stimuli (e.g. video or animation sequences) and then present a variety of responses from which to choose. Feedback can be given depending on which response the learner selects.

Other types of interactive exercises include "drag-and-drop", which in developer's parlance, "…is an intuitive GUI (Graphical User Interface) gesture used for transferring data from one GUI component to

another" (De Lisa, 1999). In this type of exercise, the learner clicks on an icon and drags it to one of several other possible locations on the screen each corresponding to a potentially correct or incorrect response. This is the electronic equivalent of the familiar paper-and-pencil "matching" task that is a mainstay of K-12 educational testing, whereby a learner may be asked to draw a line between each term and its correct definition. Another popular vehicle for facilitating learner interaction is the "mouse-over" in which a user moves their mouse over a link (text or graphic) and an image or description can be displayed. The interested reader is referred to Graham (1998) and to Kristof & Satran (1995) for an in-depth treatment of other vehicles for facilitating user interaction.

WBT can also be used to present *dynamic* content. This means the content that is presented to the learner next can change depending on the learner's previous choices and responses. In contrast to text-based manuals which are typically processed in linear fashion, from start-to-finish, the ability to present dynamic content means that WBT can be truly self-paced or individualized (Morrison, Ross, & Kemp, 2001). Learners who demonstrate their proficiency at a basic skill by meeting initial learning objectives can follow an accelerated learning path, whereas learners whose previous responses indicate that they may need remediation can be provided with the content that is appropriate for their current level of performance. In recent years, the rapid evolution of powerful database development platforms makes the creation of complex, individualized learning paths much more feasible.

(3) Case-based presentations can provide realistic clinical context

In mental health, as in medicine, clinicians typically think about their work in the context of the cases that they treat. This clinical, case-based framework can be incorporated in web applications to create MBTs that practicing clinicians find relevant and engaging. IDT processes and tools allow for media-rich presentation of complex case information, for example using a video role play to model therapist behavior in a difficult client-therapist interaction. In addition to the use of such case-based material for didactic purposes, media rich presentations can also be used to conduct scenario-based assessments of how the learner/therapist would react to a hypothetical case. In this type of application, a subject-matter expert would work with an instructional designer to articulate two or three key lessons he or she would like to internalize and then use storyboards to highlight a success path for that lesson, and one or two failure paths. The storyboard could then be developed as a video segment depicting a

therapist-client interaction that intermittently stops the action and provides the learner the opportunity to make a choice about what the therapist should do or say next. The learner would then receive appropriate feedback on his or her response. Kindley (2002) presents a more detailed treatment of scenario-based e-Learning.

A third way in which case-study information could potentially be applied in the context of Web Based Training is in a Problem-Based Learning (PBL) framework. In this methodology, often used in medical education, students are exposed to an array of real and simulated patients and presenting problems. They then generate hypotheses, gather data, synthesize information from multiple sources and generate diagnoses and treatment plans (Barrows & Tamblyn, 1979). Research has found that PBL students tend to retain, integrate, and transfer information better than students exposed to traditional didactic instruction (Norman & Schmidt, 1992). Although there is virtually no existing literature regarding PBL for psychotherapy training, the potential role of communication and instructional technologies in the exploration of this area are clearly promising.

(4) Eclectic versus rule-governed implementation can be evaluated

One of the most debated issues about MBTs' potential role as vehicles for dissemination is the degree to which practicing clinicians must closely adhere to the structured treatment protocol. Whereas some argue that close adherence to manualized protocols is necessary to replicate the positive findings from randomized clinical trials (Wilson, 1998), others argue that practicing clinicians are better served if they are encouraged to implement the new skills and techniques in an eclectic fashion when, according to their clinical judgment, the skills seem to apply to the specific case at hand (Hayes, 2002; Kendall, Chu, Gifford, Hayes & Nauta, 1998). Although WBT does not allow for the experimental manipulation of the flexibility with which an MBT is implemented in actual clinical practice, it does allow one to manipulate the degree of control that the learner has over how the content is accessed during training. Consequently, one can design a WBT to promote relatively more or less flexible implementation of a particular MBT.

A variety of research designs could be used to test hypotheses regarding flexibility in implementation. For example, participants in one condition might take a WBT course that forces them to go through each of the modules in a linear fashion. To provide even tighter control over access to content, the WBT could be programmed so that participants could only access the content for a specific

session the day before that session was to take place. To ensure faithful implementation of the MBT during the actual sessions, participants could be provided with the same high level of supervision and feedback that typically is provided to research therapists during randomized clinical trials. The comparison condition might consist of a WBT that contains the identical MBT content but is programmed to provide learners with access to the content that they want, when they want it, in any order, and in as much or as little detail as they would like. Clinical outcomes of patients being treated by participants in these two interventions could be compared to one another as part of a randomized clinical trial, or as part of a straightforward effectiveness trial (c.f. Strosahl, Hayes, Bergan, & Romano, 1998). Regardless of the evaluation methodology, the point is that IDT processes and tools allow one to experimentally manipulate the flexibility with which the training is actually delivered.

(5) Content can be reused

In recent years, the proponents of e-Learning have adopted a set of standards to ensure interoperability of e-Learning content across different technology platforms. Much as mass production and standardized parts revolutionized the automobile industry, the standardization of e-Learning content development and delivery systems has the potential to radically improve the efficiency of developing materials to aid the learning process. The e-Learning standard was originally developed by the United States Department of Defense and is referred to as the Sharable Content Object Reference Model (SCORM). Once again, the interested reader is referred elsewhere to find a detailed description of this model (ADL, 2002). For purposes of this article, I provide only the briefest of overviews to give the reader a rudimentary conceptual understanding necessary to appreciate the implications for dissemination of MBTs.

A straightforward (and vastly oversimplified) way to explain SCORM is by drawing an analogy to Leggo™ building blocks. In this analogy, each individual Leggo block corresponds to what is referred to as a "Learning Object", which is a self-standing, discrete piece of instructional content that meets a learning objective. Each Learning Object consists of three fundamental elements: (1) Instructionally sound content with a focused learning objective, (2) Learner-centered, rich media environments that enable the learner to practice, learn and receive assessment, and (3) Metadata or keywords that describe

the attributes of the Learning Object and the available mechanisms for communicating with management systems or other web applications (ADL, 2002).

The primary advantage of building "SCORM conformant" e-Learning Objects is a technical one: the course will be compatible with the wide variety of Learning Management Systems that are currently being used to launch and track online courses. However, there is an equally compelling conceptual reason to ensure that WBTs conform with SCORM. Because each Learning Object is discrete, self-contained, and focuses on one and only one learning objective, different constellations of learning objects can be combined to form different lessons, and different amalgamations of lessons can be combined to form courses.

For example, in the NIDA treatment manual "A Cognitive Behavioral Approach for the Treatment of Cocaine Addiction" (Carroll, 1998) there are a number of modules that include reference to discrete topics, such as identifying relapse triggers and enhancing motivation to maintain continued abstinence. Our WBT design team has decided to view each of these sub-modules as discrete Learning Objects, and to develop the content in such a way that each sub-module can be designed, indexed and tagged, so that it can easily be repurposed. Whether we choose to use our "Motivational Enhancement" sub-module elsewhere in the current WBT, to insert it in a different course, or to produce it as a stand-alone product, little if any technical reworking will be necessary. Rather than reinventing the wheel each time we begin a new project, we can examine our library of existing learning objects and begin by leveraging much of the work that we have done to date.

(6) Client self-study materials can be integrated with clinician training

Another advantage of using WBT for the dissemination of empirically-supported, manual-based therapies it is that it is possible to closely integrate client self-study materials (e.g., self-monitoring tasks, homework assignments) into the MBT itself. To do so simply requires the design and development of a companion web application for clients – an online client workbook, so to speak. This companion web application can contain all of the forms, reminder cards, etc. that are discussed during each session, as well as any supplementary resources or exercises that may be appropriate. As clients complete each form, it can be electronically submitted to the therapist WBT, thereby making it available for review during the next session. Although this sophisticated technology will not eliminate the perennial problem of

clients not completing their homework, it would allow therapists to keep a closer tab on client progress and to address problems in a more timely fashion.

As mentioned previously, there is evidence that certain stand-alone computer-based treatments can be as effective as therapist administered treatment for certain disorders (e.g. Selmi et al., 1990) (Newman, Consoli & Taylor, 1995; Rothbaum, et al., 2000). Building a WBT for therapists that could interact with, and complement, the existing computer-based treatment could conceivably enhance the effectiveness of the original stand-alone application. It might be the case that providing a technology-based medium by which the therapist could actively participate in the structured, self-administered intervention could act synergistically to improve client outcomes. For example, the WBT might inform the therapist that the client has been having trouble completing a particular assignment, thereby prompting the therapist to address that issue during the next session.

The role of synchronous e-Learning in disseminating Manual-Based Therapies

Synchronous e-Learning platforms also have several potential applications for clinical training. First, these platforms can be used to facilitate case observation and real-time clinical supervision. For example, a web-cam in the therapy room could be used to transmit a live audio and video stream of the interaction between a trainee who is learning to use a MBT and his or her client, to a clinical supervisor in her office or virtually anywhere else that has broadband internet access. Many vendors can encrypt live video streams to protect the client privacy. After observing the live session, the supervisor could activate her web-cam so the trainee and supervisor could see and hear one another, and could debrief about the session immediately. Alternatively, they could arrange to “meet” online at some mutually convenient time in the future. Many vendors also allow for the recording and archiving of virtual sessions, so that therapist and/or supervisor could review the session at a later date.

Another potential application of this type of technology is for group supervision or training workshops. Here, an experienced clinician, who might be geographically separated from a group of trainees, would be available to meet with them virtually to provide expert instruction and feedback about implementing an MBT in their practice setting. Clinical cases could be presented, recorded sessions could be reviewed and discussed, and therapeutic techniques and strategies could be demonstrated

through role play and modeling. Note that the trainees need not be physically present at the same place for the training, but could also access the session remotely via the Internet.

Synchronous e-Learning platforms can also be used to mediate direct, real-time interaction between a therapist and his or her client. Such online interaction has become known as "e-Therapy", and has been the topic of considerable interest and debate over the past few years. Because this application of IDT is beyond the present focus on clinical training, the interested reader is referred to Grohol (1999), Hsiung (2002), and Maheu (2003) for a detailed discussion.

The role of IDT relative to traditional clinical training and continuing education activities

IDT is an adjunct to, not a replacement for, traditional clinical training and supervision

The most promising role for these technology-based delivery mechanisms is as an adjunct to, rather than a replacement for, traditional training. Although many in the corporate training and development industry have been quick to jump on the e-Learning bandwagon, and proclaim online learning as the sole solution to any and all training needs (see Rosenberg, 2001), recent research suggests that the industry is rapidly moving towards a more "blended" approach in which self-paced WBT courses are offered in conjunction with instructor-led lectures, face-to-face group exercises, online mentors and other traditional forms of instruction and support (Barbian, 2002).

Particularly in clinical psychology, where a primary goal is to train clinicians in the subtleties and nuances of MBTs, there is simply no replacement for face-to-face classes and supervision. However, both synchronous and asynchronous e-Learning do have a variety of important, adjunctive roles to play. Some of the ways that synchronous e-Learning can be incorporated with traditional supervision and training were described above. Using an asynchronous platform, a trainee might be asked to complete a WBT course on a particular MBT as a prerequisite to implementing that protocol in a supervised clinical setting. Here, the WBT would serve a didactic function by providing a broad overview and conceptual understanding of the approach, much like attending an introductory lecture or reading a textbook. Valuable face-to-face practicum time could then be devoted to discussing the challenges of applying the MBT in the context of a specific case presentation.

IDT can provide additional options for obtaining required continuing education

Clinicians who practice in rural areas or who otherwise lack easy access to high-quality Continuing Education activities will likely benefit from technology-delivered instruction that can be accessed anytime, anywhere Internet access is available. Practitioners who have physical disabilities that limit their mobility might also choose to fulfill their CE requirements by completing these activities online. In fact, a wide variety of accredited online CE activities are currently available for these individuals as well as many other busy clinicians who simply appreciate their convenience and relatively low cost. Practitioners who are unable to attend traditional CE activities and also lack access to a computer with an Internet connection can often obtain CE credits on a "home study" basis, i.e. by reading a paper-based MBT and obtaining a passing grade on a post-test. Because successful migration of MBT content to an IDT format ensures that the content of the web-based modules remains true to the original paper-based manual, practitioners who choose to learn about the MBT by reading the manual should not be at a disadvantage relative to those who are able to learn about the MBT online. For those practitioners who do have a computer, but lack internet access, another option would be to disseminate the WBT program on a CD-ROM or DVD.

Addressing organizational and systemic barriers to change

IDT is not a panacea. Nor is it a process that can operate in a vacuum. IDT cannot address psychological reactance and/or rational objections that individual practitioners may have about evidence-based, manual-driven practice. Nor can IDT alone address the many intrapersonal, interpersonal, organizational and systemic barriers that can prevent changes in clinical practice (Goldman, Ganju, Drake, Gorman, Hogan, Hyde & Morgan, 2001; Pincus, Pechura, Elinson & Petit, 2001). Using the framework developed by evidence-based medicine researchers (e.g. Grol, 1997, 2001; Grol & Grimshaw, 1999), the role of IDT in the dissemination of empirically-supported MBTs can best be classified as an *educational* approach to changing clinical practice. Because the educational approach relies heavily upon the intrinsic motivation of professionals to acquire new knowledge, skills and abilities, dissemination efforts that rely exclusively on this narrow approach are unlikely to be unsuccessful.

Interventions designed to change clinical practice are most likely to be successful when they combine multiple approaches (Grol, 2001; Shaneyfelt, 2001). Table 1 summarizes the wide variety of

available approaches to changing clinical practice. Although this synthesis was generated from a review of the evidence-based medicine literature, it applies equally well to the dissemination and implementation of empirically supported MBTs. The first three approaches outlined, including the educational, epidemiological, and marketing approaches, all attempt to change clinical practice by influencing the internal cognitive and affective processes of the individual practitioner. As such, they alone cannot address the systemic barriers to change that exist at the patient, practice, health plan and purchaser levels (Pincus et al., 2001).

By focusing on influences that are external to the individual clinician, a second broad category of interventions can serve as powerful complements to internally-focused approaches (see approaches 4-7 in Table 1). To be maximally effective, an educational approach such as using IDT to educate clinicians about an empirically-supported MBT could be embedded in a larger intervention focused on external, systemic influences. For example, a clinician who has completed our WBT on providing Cognitive-Behavioral Therapy for clients with a Substance Use Disorder could subsequently receive a visit from an expert consultant who could answer questions and provide on site supervision ("academic detailing", a social interaction approach c.f. Mittman, Tonek & Jacobson, 1992). In addition, the Managed Behavioral Health Organization (MBHO) for which the clinician works could ensure that the relevant templates and codes for CBT are added to the computerized practice management system, and that practitioners are allocated a sufficient number of sessions in which to complete the manualized (organizational approach). More active organizational approaches to large-scale implementation of ESTs could also be pursued. For example, the State of Hawaii recently formed a multidisciplinary Empirical Basis to Services Task Force in an effort to improve mental health practice for children. This task force reviewed the empirically supported treatment literature for children and established a process by which a university, State Department of Public Health, and family partnership was established to address specific issues of relevance to statewide implementation of empirically-based services. The interested reader is referred to Chorpita, Yim, Donkervoet, Arensdorf, Amundsen, McGee, Serrano, Yates, & Morelli (2002) for a more detailed description of this ambitious project.

On a more molecular level, behavioral or coercive approaches could also be used. For example, an MBHO might program their practice management system to automatically remind the clinician to offer

the MBT for patients whom they have diagnosed with a Substance Use Disorder (behavioral approach). Although these approaches may well raise legal and ethical concerns, the clinician could also be offered a financial incentive to implement the MBT with appropriate patients (behavioral approach), and/or to sanction the practitioner when she or he fails to implement it (coercive approach).

One might ask what would motivate an MBHO to use IDT to disseminate manual-based treatments in the first place? Given that managed care systems can be more focused on the financial implications of their operations than on the degree to which their participating providers are delivering evidence-based treatments, the cost savings associated with using IDT for clinical training is a major issue. Although no data is available that directly addresses the cost savings associated with training for mental health practitioners, several dramatic examples from the world of business highlight the substantial cost savings associated with moving training activities online. For example, in 1999, Ernst & Young re-aligned and condensed 2,900 hours of classroom training into 700 hours of web-based learning, 200 hours of distance learning and 500 hours in the classroom, which resulted in an overall reduction of 35% in training costs (Hall & LeCavalier, 2000). That same year, the Internal Revenue Service generated an estimated travel cost savings of $40 million by conducting 30% of its training via e-Learning (Hall & LeCavalier, 2000). Similarly, the Rockwell Collins corporation reduced learning and development expenditures by 40% by converting 25% of its classroom offerings to Computer-Based Training/Web-Based Training, while more than doubling the total number of learning offerings (Hall & LeCavalier, 2000). Given the magnitude of these cost savings, it seems likely that administrators of MBHOs would be receptive to experimenting with technology-based training delivery mechanisms in their own organizations.

Research on the diffusion of innovations provides another valuable perspective on the larger social and systemic factors that can influence the process of changing clinical practice. Because a comprehensive synopsis of the diffusion literature is beyond the scope of this article, the interested reader is referred to Rogers (1995) who has conducted much of the seminal work in this area. Very briefly, the innovation-decision process is a process by which an individual such as a practicing clinician, passes from (1) *knowledge* - first knowledge of an innovation, such as awareness of the CBT for treating patients with Substance Use Disorder, to (2) *persuasion* - forming an attitude about it, either favorable or

unfavorable, to (3) *decision* – a decision to adopt or reject the innovation, to (4) *implementation* – which involves actually putting an innovation to use, for example using CBT in one's daily clinical practice, and finally to (5) *confirmation* – which occurs when an individual seeks reinforcement of a decision that has already been made.

The potential role of IDT in the process of diffusing an innovative, manual-driven, empirically supported therapy lies primarily in the *knowledge* stage. A well-designed WBT could be quite effective at delivering what Rogers (1995) refers to as *how-to knowledge*. How-to knowledge consists of information necessary to use an innovation properly. In the case of clinical training, this how-to knowledge can be quite complex, including how to identify clients for whom the treatment is appropriate, how to structure the therapy, how to correctly utilize various clinical techniques and strategies, how to deal with clients who are not responding to treatment, etc. Another type of knowledge that WBT might effectively deliver is referred to as *principles-knowledge,* which consists of information dealing with the functioning principles underlying how the innovation works. In our case, the principles-knowledge would consist of the theory underlying Cognitive-Behavioral Therapy, for example, why one would want to conduct a functional analysis or use a skills training approach.

This knowledge stage is extremely important, for when an adequate level of knowledge (particularly how-to knowledge) is not obtained prior to the trial and adoption of an innovation, rejection and discontinuance are likely to result (Rogers, 1995). As was discussed in the context of the various approaches to changing clinical practice, knowledge transfer is a purely educational intervention that constitutes a necessary but insufficient condition for effecting enduring change in clinical practice. Before changing his or her practice behavior, the individual clinician must first develop a favorable attitude towards the innovation. In contrast to the knowledge stage, which consists of primarily cognitive activity, this persuasion stage is largely affective and involves the individual seeking out innovation-evaluation information from their peers or local opinion leaders. Here again, IDT may play an instrumental role.

In addition to delivering principles-knowledge and how-to knowledge, IDT could also be used to deliver persuasive communications designed to influence learner attitudes. The same principles that govern the effectiveness of print and broadcast advertisements may well apply to WBT and other forms of technology-based training delivery mechanisms. For example, the Elaboration Likelihood Model (Petty &

Caccioppo, 1986) posits that the influence exerted by various communication elements will depend on the elaboration (issue-relevant thinking) that occurs during processing. When elaboration is high, the central route to persuasion is followed, where only those message elements (called arguments) relevant to forming a "reasoned" opinion are influential. Conversely, the peripheral route to persuasion occurs under low levels of elaboration as elements (called peripheral cues) that are irrelevant to developing a reasoned opinion become influential. Elaboration in turn depends on the person's motivation and ability during message processing.

As in print and broadcast media, developing a persuasive communication that can be embedded in a WBT might involve anticipating how much elaboration is likely to occur during message processing. If learners are motivated to learn about a particular MBT, then elaboration is likely to be high and more emphasis on including compelling rational arguments would be appropriate. When this is not the case, other techniques such as manipulating the attractiveness and credibility of the message source, or attempting to influence the learner's perceptions of the emotional or symbolic features of a particular MBT might be more effective (Puto & Wells, 1984). For example, if we anticipate that community drug abuse counselors will be relatively less motivated to learn about the Cognitive-Behavioral approach outlined in our NIDA Clinical Toolbox WBT, we might consider having the course hosted and narrated by an attractive, experienced counselor who is in recovery him or herself. Testimonials from clients who have benefited from this approach are another means of emphasizing the peripheral route to persuasion. Conversely, if we anticipate that community counselors will be highly motivated to learn this material, we might emphasize the central route to persuasion and provide rational arguments such as links to studies demonstrating its effectiveness

Conclusion and Future Directions

The principles, processes and tools of Instructional Design and Technology (IDT) can be used to effectively migrate the content of empirically-supported Manual-Based Therapies (MBTs) from paper-based, text-intensive manuals to easy-to-use, engaging Web-Based Training (WBT) applications. MBTs serve as an uncommonly efficient starting point for the development of instructionally sound WBT applications, and such applications would have many advantages over their existing paper-based

counterparts. Potential advantages include improvements in learner engagement, providing designers and developers with the ability to efficiently re-use content, and the ability to closely integrate client self-study materials with clinician training. Furthermore, synchronous e-Learning could significantly enhance the efficiency of clinical supervision and training by providing a platform for supervisors and trainees who are geographically separated to conduct one-on-one supervision, review videos of sessions together, and to conduct virtual workshops wherein supervisors could demonstrate new strategies and techniques as they interact with trainees in real time.

Despite the potential of this approach, one need only refer back to the ADDIE instructional design model to realize that we have yet to touch upon the important issues of Implementation and Evaluation. Once a researcher has invested the time and effort required to successfully migrate the content from an empirically-supported manual to a WBT format, how would the online course be delivered to its target audience? Who would be responsible for hosting the course? Who would be responsible for registering participants and reporting their test scores? Who would be responsible for ongoing maintenance and technical support? Large public corporations and universities typically invest many millions of dollars in enterprise-grade software applications called Learning Management Systems (LMS) to perform these critical functions (Hall & LeCavalier, 2000; Rosenberg, 2001). In the absence of such a centralized organizational structure, how would our profession handle these demands? Would APA be willing to sponsor an LMS that would allow practitioners to access all of the empirically-supported, MBT-based, online courses that are currently available? Would practitioners who access an online course be willing to share in the cost of this system?

At this very early stage, there are certainly more questions about implementation than there are answers. Fortunately, designers and developers do not necessarily have to wait until all of these issues are resolved in order to initiate the instructional design process for an individual MBT. In my previous work providing strategic consulting services to corporate training and development departments in the technology industry, I have noticed that early adopters often design and develop e-Learning applications long before their organization has an LMS up and running. Initially, they might host the course on a server across the hall (or under their desk!) and advertise its availability locally via word-of-mouth. Once the corporate LMS is available, these individuals then post their WBT on the system, thereby making it

available on larger scale. My research team has been through a similar process whereby we first developed a prototype WBT on a local machine and later moved it to an LMS sponsored by one of the institutions with which we are affiliated. The point here is that larger implementation issues, while critically important, can be addressed before, during or after development has been completed.

Finally, and perhaps most importantly, we come to the issue of evaluation. Training and development professionals typically conduct only a Kirkpatrick Level 1 evaluation, demonstrating that participants are satisfied with their learning experience, and sometimes a Level 2 evaluation, wherein participants demonstrate that they have obtained new knowledge and skill by achieving a passing score on a test. Researchers are interested in conducting much more rigorous evaluations. In addition to Levels 1 and 2, we must also demonstrate that participants are able to transfer newly acquired knowledge and skills into improvements in job performance (Level 3) and that these improvements in job performance affect the bottom line (Level 4). For example, in measuring the impact of our NIDA WBT, we must demonstrate that (1) clinicians like our WBT, and (2) that after completing the course they can demonstrate improved knowledge about CBT for treating patients with Substance Use Disorder. However, we must also demonstrate (3) that they change their clinical practice by adhering to the new CBT protocol, and (4) that their patients experience improved outcomes as a result.

The challenges of evaluating therapist adherence to or fidelity with an empirically-supported protocol disseminated via IDT (Level 3 evaluation) are not necessarily any greater than the challenges of evaluating adherence to a MBT that is disseminated via traditional clinical training. As in any psychotherapy efficacy trial, therapists who receive training in a new protocol via IDT would need to be videotaped (or recorded on digital video), and the labor-intensive process of reviewing those videos and rating therapist adherence to the protocol would need to be completed. Similarly, ongoing compliance could only be ensured via continued monitoring of in-session behavior via live supervision or videotape review. Granted, e-Learning platforms might facilitate this process, for example, by allowing a supervisor to observe a session in real-time via a synchronous platform, or by facilitating the asynchronous archiving and viewing of digital video segments to facilitate the coding of therapist adherence. However, the arduous and time-consuming process of evaluating adherence/fidelity, compliance and providing adequate one-on-one supervision would be substantially the same.

A risk inherent in using IDT for disseminating manual-based therapies is that some may try to implement a particular technology-based intervention without maintaining an appropriate level of quality control over the training environment. In traditional environments such as university graduate school training, internship or specialized institutes, the supervisor typically has a significant degree of control, both to determine which trainees require remediation, and also to prevent unqualified trainees from having clinical contact. Only in the context of a controlled clinical training environment can we ensure that trainees apply technology-delivered clinical training content in an ethical, responsible, and effective manner. Thus, traditional training environments have an important role to play in the dissemination of MBT content via IDT, for they ultimately maintain responsibility for how trainees go about implementing these treatments with real-world clients.

The notion that therapist adherence, fidelity and compliance must be carefully measured is most consistent with what Hayes (2002) refers to as the "systematic replication" model of dissemination. In this model, dissemination research tests the external validity of scientifically proven technologies, identifying subpopulations of responders and non-responders, and the necessary and sufficient conditions for replication of the results obtained in efficacy trials. In contrast, Hayes (2002) proposes a practical application model, wherein dissemination research examines how to improve outcomes in the real world of health care delivery. In this model, the focus is not on strict adherence to MBT protocol, but rather on the identification of "…technologies that clinicians are willing to accept and adopt. If they are to hard to learn, too confusing, too complex, or too boring, then that limits their practical applicability… (p. 411).

Instructional Design and Technology can provide clinical researchers with the processes and tools required to empirically evaluate dissemination efforts under either of these two models. For example, IDT would make it easier to deliver the increasingly comprehensive, detailed, and complex MBTs that focus on the identification of the exceptions, combinations and subpopulations that are found to limit or enhance effectiveness under the systematic replication model. Alternatively, in keeping with the practical application model, which views the ideal therapy manuals as "humble, simple and short…(p. 411), MBT content could be presented on a simple website that allows clinicians to quickly access only that information that they find relevant and useful for the case at hand. From either perspective, the role of IDT in the dissemination of empirically-supported therapies may well be quite substantial.

References

Addis, M. (1997). Evaluating the treatment manual as a means of disseminating empirically validated psychotherapies. Clinical Psychology, 4, 1-11.

Addis, M. E., & Waltz, J. (2002). Implicit and untested assumptions about the role of psychotherapy treatment manuals in evidence-based mental health practice. Clinical Psychology: Science and Practice, 9(4), 421-424.

ADL (2002). ADL SCORM Version 1.3 Application Profile. Advanced Distributed Learning Co-Laboratories. Available: www.adlnet.org [2003, 03-04-03].

ASTD (2002). The 2002 ASTD International Comparisons Report.: American Society for Training and Development. Available: www.astd.org/virtual_community/research/ [2003, June 11, 2003]

Barbian, J. (2002). Blended Works: Here's Proof. Online Learning Magazine, 6 (6), 26-31.

Barrows, H. S., & Tamblyn, R.M. (1979). Problem-based learning in health sciences education (Monograph Contract No 1 LM-6-4721.). Bethesda, MD: National Library of Medicine, National Institutes of Health.

Baum, B. E., & Gray, J.J. (1992). Expert modeling, self-observation using videotape, and acquisition of basic therapy skills. Professional Psychology - Research & Practice, 23(3), 220-225.

Beutler, L. E. (2002). It's isn't the size, but the fit. Clinical Psychology: Science and Practice, 9(4), 434-438.

Brabender, V. (2002). Videotape resources for group psychotherapists: A 5-year retrospective. International Journal of Group Psychotherapy, 52(2), 253-263.

Branson, R. K. (1975). Interservice procedures for instructional systems development: Executive summary and model (Document Nos AD-A019, 486 to AD-A019 490). Tallahassee, FL: Center for Educational Technology, Florida State University.

Burton, J., Moore, D., & Magliaro, S. (1996). Behaviorism and instructional technology. In D. Jonassen (Ed.), Handbook of Research for Educational Communications and Technology. New York: Macmillan.

Carey, J. M. (2001). Effective student outcomes: A comparison of online and face-to-face delivery modes, [website]. Pennsylvania State University College of Education. Available: http://www.ed.psu.edu/acsde/deos/deosnews/deosnews11_9.asp [2002, Nov 20, 2002].

Carroll, K. M. (1998). A Cognitive-Behavioral Approach: Treating Cocaine Addiction (Therapy Manual for Drug Addiction NIH Publication Number 98-4308). Rockville, MD: US Department of Health and Human Services, National Institutes of Health.

Carroll, K. M., & Nuro, K.F. (2002). One size cannot fit all: A stage model for psychotherapy manual development. Clinical Psychology: Science and Practice, 9(4), 396-406.

Chorpita, B. V., Yim, L.M., Donkervoet, J.C., Arensdorf, J.C., Amundsen, M.J., McGee, C., Serrano, A., Yates, A., & Morelli, P. (2002). Toward large scale implementation of empirically supported treatments for children: A review and observations by the Hawaii Empirical Basis to Services Task Force. Clinical Psychology: Science and Practice, 9, 165-190.

Craighead, W. E., & Craighead, L.W. (1998). Manual-based treatments: Suggestions for improving their clinical utility and acceptability. Clinical Psychology: Science and Practice, 5(3), 403-407.

Craik, F. I. M., & Lockhart, R.S. (1972). Levels of processing: A framework for memory research. Journal of Verbal Learning and Verbal Behavior, 11, 671-684.

De Lisa, G. (1999). How to drag and drop with Java 2, Part 1, [website]. Java World: Fueling Information. Available: http://www.javaworld.com/javaworld/jw-03-1999/jw-03-dragndrop.html [2003, March 4, 2003].

Dempsey, J. V., & Reiser, R.A. (2002). Trends and Issues in Instructional Design and Technology. Upper Saddle River, NJ: Prentice Hall Inc.

Dick, W., & Carey, L. (1996). The Systematic Design of Instruction (4th ed.). New York: Harper Collins.

Driscoll, M. (1998). Web-Based Training: Using Technology to Design Adult Learning Experiences. Hoboken, NJ: Jossey Boss.

Fine, M., & McIntosh, D.K. (1986). The use of interactive video to demonstrate differential approaches to marital and family therapy. Journal of Marital and Family Therapy, 12(1), 85-89.

Gagne', R. M., Briggs, L.J., & Wager, W.W. (1992). Principles of Instructional Design (4th ed.). New York: Harcourt Brace Janovich College Publishers.

George, T. (2002). E-Government gets going with e-training portal. Information Week. Available: http://www.informationweek.com/story/IWK20020712S0014 [2003, June 11, 2003].

Goldman, H. H., Ganju, V., Drake, R.E., Gorman, P., Hogan, M., Hyde, P.S. & Morgan, O. (2001). Policy Implications for Implementing Evidence-Based Practices. Psychiatric Services, 52(12), 1591-1597.

Graham, L. (1998). Principles of Interactive Design. Independence, KY: Delmar Learning.

Greist, J. H., Marks, I.M., Baer, L., Kobak, K.A., Wenzel, K.W., Hirsch, M.J., Mantle, J.M., & Clary, C.M. (2002). Behavior Therapy for Obsessive-Compulsive Disorder Guided by a Computer or by a Clinician Compared With Relaxation as a Control. Journal of Clinical Psychiatry, 63(2), 138-145.

Grohol, J. M. (1999). Definition & Scope of e-therapy. Dr. John Grohol's Psych Central. Available: http://psychcentral.com/best/best3.htm [2003, June 9, 2003].

Grol, R. (1997). Beliefs and evidence in changing clinical practice. British Medical Journal, 315, 418-421.

Grol, R. (2001). Improving the quality of medical care: Building bridges among professional pride, payer profit and patient satisfaction. Journal of the American Medical Association, 286(2), 2578-2601.

Grol, R., & Grimshaw, J. (1999). Evidence-based implementation of evidence-based medicine. The Joint Commission Journal on Quality Improvement, 25(10), 503-513.

Gustafson, K. L., & Branch, R.M. (2002). What is Instructional Design? In R. A. D. Reiser, J.V. (Ed.), Trends and Issues In Instructional Design and Technology. Upper Saddle River, NJ: Pearson Education, Inc.

Hall, B. (1997). The Web-Based Training Cookbook. New York: John Wiley & Sons.

Hall, B., & LeCavalier, J. (2000). E-Learning Across the Enterprise: The Benchmarking Study of Best Practices. Sunnyvale, C.A.: brandon-hall.com.

Harris, J. M., Kutob, R.M., Surprenant, Z.J., Maiuro, R.D., & Delate, T.A. (2002). Can Internet-based education improve physician confidence in dealing with domestic violence. Family Medicine, 34(4), 287-292.

Hayes, S. C. (2002). Getting to dissemination. Clinical Psychology: Science and Practice, 9(4), 410-415.

Horton, W. (1999). Designing Web-Based Training: How to Teach Anyone Anything Anywhere Anytime. Hoboken, NJ: John Wiley & Sons.

Hsiung, R. C. (2002). E-Therapy: Case Studies, Guiding Principles, and the Clinical Potential of the Internet. New York: W.W. Norton & Company.

IHEP (1999). What's the difference: A review of contemporary research on the effectiveness of distance learning in higher education. Washington, D.C.: The Institute for Higher Education Policy.

Johnson, S. D., Aragon, S.R., Shaik, N., & Palma-Rivas, N. (2000). Comparative analysis of learner satisfaction and learning outcomes in online and face-to-face learning environments. Journal of Interactive Learning Research, 11(1), 29-49.

Kaplan-Leiserson, E. (2003). Learning Circuits e-Learning Glossary, [Web Site]. American Society for Training and Development. Available: http://www.learningcircuits.org/glossary.html [2003, 2-27-03].

Kazdin, A. E. (1998). Treatment manuals in clinical practice: Introduction to the series. Clinical Psychology: Science and Practice, 5(3), 361-362.

Kemp, J., Morrison, G., & Ross, S. (1998). Designing Effective Instruction (2nd ed.). New York: Merrill.

Kendall, P. C. (1998). Directing misperceptions: Researching the issues facing manual-based treatments. Clinical Psychology: Science and Practice, 5(3), 396-399.

Kendall, P.C., Chu, B., Gifford, A., Hayes, C., & Nauta, M. (1998). Breathing life into a manual: Flexibility and creativity with manual-based treatments. Cognitive and Behavioral Practice, 5, 177-198.

Kindley, R. W. (2002). Scenario-Based E-Learning: A Step Beyond Traditional E-Learning. American Society for Training and Development. Available: http://www.learningcircuits.com/2002/may2002/kindley.html [2003, 03/04/03].

Kirkpatrick, D. L. (1959a). Techniques for Evaluating Training Programs. Journal of American Society for Training & Development, 13(11), 3-9.

Kirkpatrick, D. L. (1959b). Techniques for Evaluating Training Programs: Part 2--Learning. Journal of American Society for Training & Development, 13(12), 21-26.

Kirkpatrick, D. L. (1960a). Techniques for Evaluating Training Programs: Part 3--Behavior. Journal of American Society for Training & Development, 14(1), 13-18.

Kirkpatrick, D. L. (1960b). Techniques for Evaluating Training Programs: Part 4--Results. Journal of American Society for Training & Development, 14(2), 28-32.

Kristof, R., & Satran, A. (1995). Interactivity by Design.: Adobe Press.

Lambert, M. J. (1998). Manual-based treatment and clinical practice: Hangman of life or promising development? Clinical Psychology: Science and Practice, 5(3), 391-395.

Lambert, M. J., & Ogles, B.M. (1988). Treatment manuals: Problems and promise. Journal of Integrative and Eclectic Psychotherapy, 7, 187-204.

Lee, W. W., & Owens, D.L. (2000). Web-Based Instructional Design: Computer-Based Training, Web-Based Training, and Distance Learning. Hoboken, NJ: Jossey-Bass.

Lewis, L., Snow, K., Farris, E., Levin, D., & Greene, B. (1999). Distance education at postsecondary institutions: 1997-98 (NCES 2000-013): U.S. Department of Education, National Center for Education Statistics.

Luborsky, L., & DeRubeis, R.J. (1984). The use of psychotherapy treatment manuals: A small revolution in psychotherapy research style. Clinical Psychology Review, 4, 5-14.

Maheu, M. M. (2003). The Mental Health Professional Online: New Questions and Answers for Practice Today. Mahwah, NJ: Lawrence Erlbaum Assoc.

Mittman, B. S., Tonesk, X., & Jacobson, P.D. (1992). Implementing clinical practice guidelines: Social influence strategies and practitioner behavior change. Quality Review Bulletin, Dec 1992, 413-422.

Morrison, G. R., Ross, S.M., & Kemp, J.E. (2001). Designing Effective Instruction (3rd ed.). New York: John Wiley & Sons.

Newman, M. G., Consoli, A.J., & Taylor, C.B. (1999). A palmtop computer program for the treatment of generalized anxiety disorder. Behavior Modification, 23(4), 597-619.

Norman, G., & Schmidt, H. (1992). The psychological basis for problem-based learning. Academic Medicine, 67(9), 557-586.

Petty, R. E., and Cacioppo, J.T. (1986). Communication and Persuasion: Central and Peripheral Routes to Attitude Change. New York: Springer-Verlag.

Pincus, H. A., Pechura, C.M., Elinson, L., & Pettit, A.R. (2001). Depression in primary care: Linking clinical and systems strategies. General Hospital Psychiatry, 23, 311-318.

Puto, C., and Wells, W.D. (1984). Informational and transformational advertising: The differential effects of time. Provo, UT: Association for Consumer Research

Reiser, R. A. (2002). A history of instructional design and technology. In Reiser, R.A., & Dempsey, J.V. (Ed.), Trends and Issues in Instructional Design and Technology. Upper Saddle River, NJ: Prentice Hall.

Rogers, E. M. (1995). Diffusion of Innovations, 4th ed. New York: Free Press.

Rosenberg, M. J. (2001). e-Learning: Strategies for Delivering Knowledge in a Digital Age. New York: McGraw Hill.

Rothbaum, B. O., Hodges, L., Smith, S., Lee, J.H. & Price, L. (2000). A Controlled Study of Virtual Reality Exposure Therapy for the Fear of Flying. Journal of Consulting and Clinical Psychology, 60, 1020-1026.

Rothbaum, B. O., Hodges, L.F., Kooper, R., Opdyke, D., Williford, J. & North, M.M. (1995). Effectiveness of computer-generated (virtual reality) graded exposure in the treatment of acrophobia. American Journal of Psychiatry, 152, 626-628.

Rothbaum, B. O., Hodges, L.F., Ready, D., Graap, K., Alarcon, R.D. (2001). Virtual reality exposure therapy for Vietnam veterans with posttraumatic stress disorder. Journal of Clinical Psychiatry, 62(8), 617-622.

Russell, T. L. (1999). The No Significant Difference Phenomenon. Montgomery, AL: IDECC Available: http://teleeducation.nb.ca/nosignificantdifference [2003, June 11, 2003].

Selmi, P. M., Klein, M.H., Greist, J.H., Sorrell, S.P. & Erdman, H.P. (1990). Computer-administered cognitive-behavioral therapy for depression. American Journal of Psychiatry, 147(1), 51-56.

Shaneyfelt, T. M. (2001). Building bridges to quality, Editorial. Journal of the American Medical Association, 286(20), 2600-2601.

Silvern, L. C. (1965). Basic Analysis. Los Angeles: Education and Training Company.

Singer, R., Riedel, J., & Leven, F.J. (1999). Innovative Medical Education in an Integrated Framework of Case-Based Learning and Web-Based Training. Journal of Medical Internet Research, 1(suppl 1), e74.

Strosahl, K. (1998). The dissemination of manual-based psychotherapies in managed care: Promises, problems, and prospects. Clinical Psychology: Science and Practice, 5(3), 382-386.

Strosahl, K. D., Hayes, S.C., Bergan, J., & Romano, P. (1998). Does field based training in behavior therapy improve clinical effectiveness? Evidence from the acceptance and commitment therapy training project. Behavior Therapy, 29, 35-64.

Turovsky, J., & Barlow, D.H. (1995). Albany panic control treatment (PCT) for panic disorder and agoraphobia. The Clinical Psychologist, 48(3), 5-6.

VanArminge, M. & Shannon, T.E. (1992). Awareness, assimilation and adoption: The challenge of effective dissemination and the first AHCPR-Sponsored Guidelines. Quality Review Bulletin, Dec 1992, 397-404.

Vogler, D. E. (1991). Performance Instruction: Planning, Delivering, Evaluating. Eden Prairie, MN: Instructional Performance Systems, Inc.

Wilson, G. T. (1996). Manual-based treatments: The clinical application of research findings. Behaviour Research and Therapy, 34, 295-314.

Wilson, G. T. (1997). Cognitive behavioral treatment of bulimia nervosa. The Clinical Psychologist, 50(2), 10-12.

Wilson, G. T. (1998). Manual-based treatment and clinical practice. Clinical Psychology: Science and Practice, 5(3), 363-375.

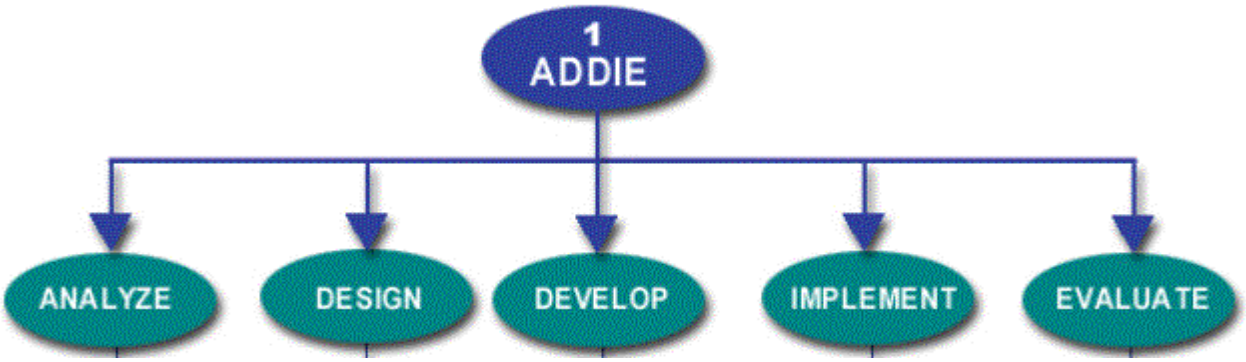

Figure 1: The “ADDIE” model: A basic model of Instructional Systems Design

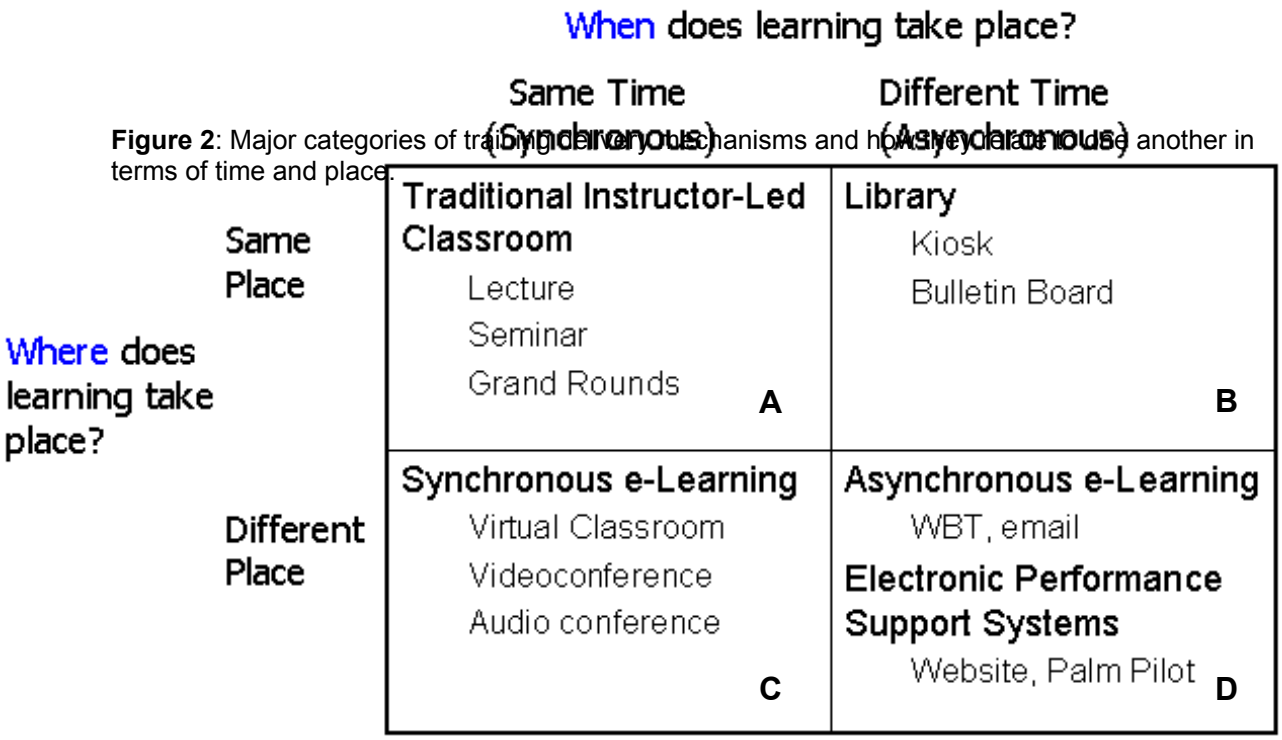

Figure 2: Major categories of training delivery mechanisms and how they relate to one another in terms of time and place.

Figure 2: Mechanisms for the delivery of instructional content and how they relate to one another in terms of time and place.

Approaches that focus on factors internal to the clinician

Approach	Focus	Example
1. Educational	***Intrinsic motivation of professionals***	***Complete Workshop, Course, WBT***
2. Epidemiological	Rational information seeking and decision making	Follow Clinical Practice Guidelines
3. Marketing	Attractive product adapted to needs of target audience	Receive brochure, promotional materials, watch Public Service Announcement

Approaches that focus on factors external to the clinician

Approach	Focus	Example
4. Behavioral	Reinforcing desired performance	Receive award or monetary bonus for desired behavior
5. Social Interaction	Social influence of significant peers/role models	Convince local opinion leader(s) to support change in practice
6. Organizational	Creating structural and organizational conditions to improve care	Form Total Quality Enhancement Team
7. Coercive	Control and Pressure, external motivation	Receive reprimand, fine, or sanction for failure to perform desired behavior

Table 1: Approaches to changing clinical practice. Adapted from (Grol, 1997, 2001; Grol & Grimshaw, 1999)