



A Model for Enhancing the  
Addiction Technology Transfer  
Initiatives Impact

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## A. Introduction

The Addiction Technology Transfer Center initiative (i.e., the ATTC) has a stated mission to unify science, education and services to transform the lives of individuals and families affected by alcohol and other drug addiction. This mission's impact can be measured on an individual (i.e., participant) or a systemic level (i.e., across a system or network of substance use disorder treatment)<sup>1</sup>. One can argue that an impact primarily measured on the individual level (e.g., with GPRA data) might make the ATTC efforts indistinguishable from other training and technical assistance efforts funded by state block grants, other federal grants, or private funds. One can also argue that if the ATTC were to have a more aligned, broader, deeper and more sustained impact, this would further its mission and likely make it easier for the ATTC to attain stable support from its fundor (Substance Abuse Mental Health Association (SAMHSA), its intended audience (substance use disorder treatment providers), and its related stakeholders (researchers, policy makers, the public, and payers).

The literature suggests that an initiative's impact can be enhanced when implementation is guided by an impact model that describes the major factors and their association with the intended outcome(s) (Campbell, 1966). The impact model can become a blueprint from which learnings can be efficiently derived, cataloged and applied. An impact model can also be used to derive learnings that apply to specific populations, treatment models, and social environments, resulting in consistent, measurable and rapidly expanding improvements. The absence of such a model results in a blind trial-and-error approach, where it becomes impossible to understand how to build upon successes and failures in order to better achieve intended outcomes.

The following suggests a series of models from which the ATTC initiative can operate. The first proposed model (**Model 1**) is based on the growing literature and support that views healthcare systems and communities as complex adaptive systems, and strongly asserts that impacting such systems requires a different, organized, and more comprehensive approach than has heretofore been applied (IOM, 2001). Using this approach, the second proposed model (**Model 2**) contains a strategy for understanding and enhancing the ATTC's impact upon the complex system of substance use disorder treatment. The third model (**Model 3**) provides a method from which learnings, both at the individual ATTC and across the ATTC network, can be captured and applied; it provides the platform from which NIH-funded researchers can **directly** apply their results to the care process; it supports more rapid improvements within substance use disorder treatment; and it permits the emergence of new principles derived from changes that are inherent with complex adaptive systems (Katz & Kahn, 1966; Yank, 1995). The final model (**Model 4**) is a proposed impact model from which the effects of the ATTC can be studied and enhanced.

## B. Complex Adaptive Systems – What Are They and How Do They Apply to the ATTC? (Model 1)

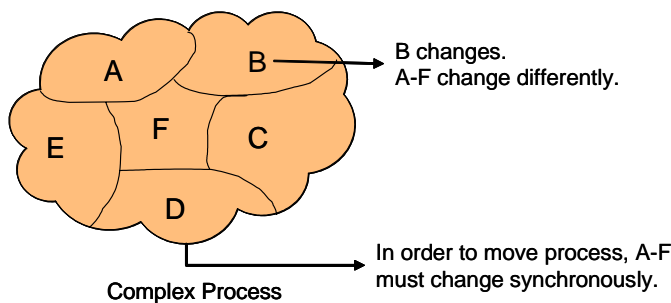
Impacting substance use disorder treatment requires that one understand how a treatment system operates and how it can likely be influenced. One way of understanding a system is to view it either as a complex (adaptive) or complicated (less adaptive) system. Both systems are

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<sup>1</sup> We are defining impact as the established association between initiatives's planned activities with its planned outcomes/output.

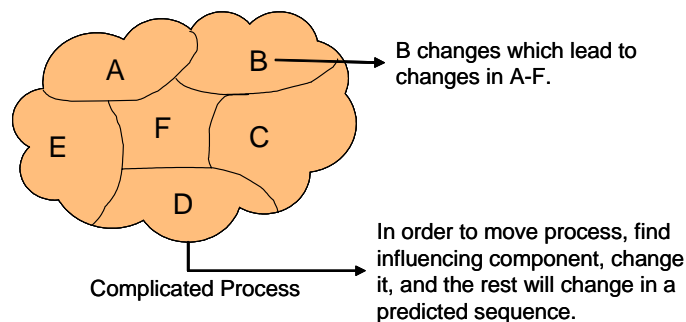
comprised of components. The primary difference is that the components within a complex system can change at different rates and under separate influences. The components within a complicated system can only change at the same time or under a single influence. Many strategies we use within the ATTC assume substance use disorder treatment is a complicated process. For example, we assume that providing one training experience, developing one curriculum, or conducting a few leadership forums will result in a measurable and sustained change that can be demonstrated both in the short and long term. These activities are usually presented singularly, and are not connected with other elements affecting the substance use disorder treatment system in a way that could enhance their impact across the treatment system (or even an individual treatment program). Further, we rarely consider the complex processes that can affect whether and how other effects of these discrete initiatives are transmitted throughout the system levels described below and how the influences within these levels can quickly obliterate these effects. Holder (1998) illustrates this point well in his book Alcohol and the Community: A Systems Approach to Prevention. He presents an example after example of failed community prevention efforts built directly from well designed, valid scientific research. He aptly asserts that these efforts failed because the planned interventions were not applied under controlled conditions (a complicated system), but within a complex adaptive system (i.e., a community). Substance use disorder treatment exists within a complex adaptive system, not a complicated system. It is time we recognized this and changed our strategies accordingly. The following figure (**Figure 1**) illustrates this point

**Figure 1**  
**Complex vs. Complicated Systems**



**Example:** Treatment program Recovery Inc. decides it will adopt Twelve Step Facilitation as its newest Evidence Based Practice (EVP). The program decides this based upon the results of its real time performance measurement system, which indicates that a root cause for why patients are not attending twelve step meetings is because their counselors are not able to successfully negotiate with them how to find a suitable program and why twelve step programming will support their recovery. The program makes a request to its local ATTC for an evidence based practice to assist it with this problem. The ATTC sends the program a portal for Twelve Step Facilitation. The portal explains what the EVP involves, why it works, and what effects might be found when it is applied. The portal also explains what resources the Recovery Inc., will need to expend to apply the process, and first steps in applying the process. The portal also provides Recovery Inc., with information on a myriad of training and technical assistance opportunities

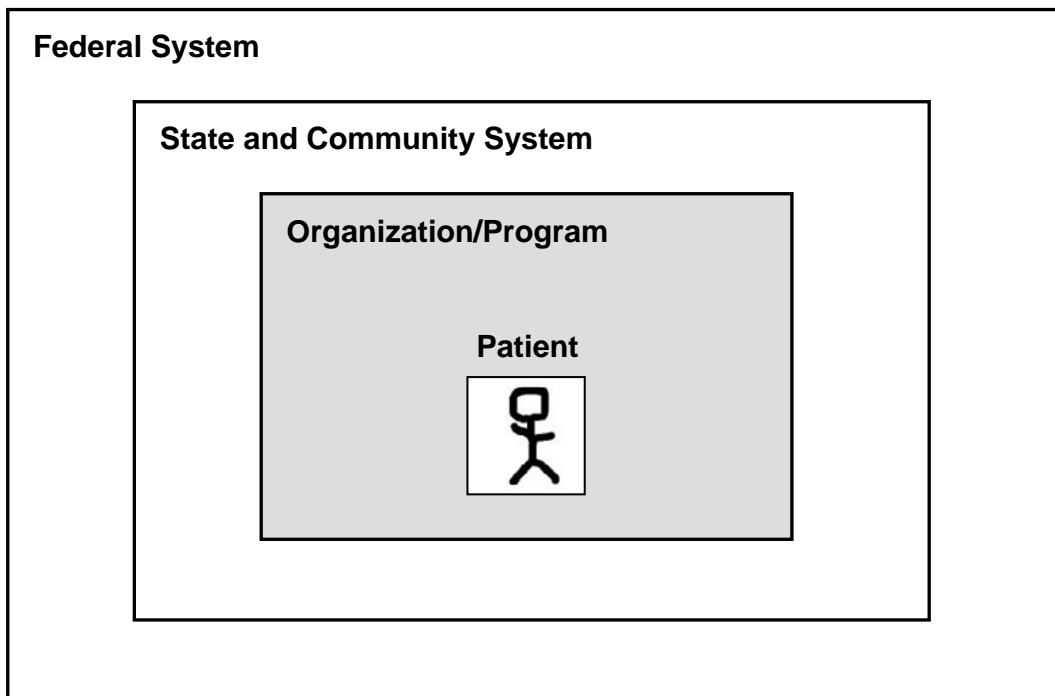
within its ATTC region that will help it apply the process moving from rudimentary knowledge to sophisticated skill development. The Recovery Inc. management confers with its line staff, presenting this information. The decision is made to adopt the process. The Recovery Inc., leadership makes sure that all its employees understand the priority of applying this process. Team leaders are assigned to monitor the implementation process, reveal problems in the implementation and solve these problems with the staff on a one by one basis. Recovery Inc. develops a system whereby all employees who receive training on this process are provided regular and meaningful feedback regarding their use of the system, and some measure of basic competency in its application. A training matrix is developed to ensure that all existing and new staff receive consistent and ongoing training and clinical assistance regarding this process. The day arrives that the implementation begins. This day is met with great fan fair by the program's leadership and staff. As the process is being applied, the application of the performance measurement data with treatment planning indicates that involvement with twelve step programs is becoming less of a problem and requires fewer and fewer analyses during clinical supervision regarding why a patient has not attended such programs. After one month, Recovery Inc.'s performance measurement data indicates that attendance in twelve step programming is at an all time high. This trend continues. Recovery, Inc. becomes a featured program at the next annual provider meeting. The state training component asks Recovery, Inc. to become a program mentor (and added to the ATTC dissemination vehicle) to other programs that wish to implement Twelve Step Facilitation.



**Example:** Company ABS runs an assembly line where it makes stereo speakers. The men and women on the Line A are required to solder wires to the inside of the speaker. Joe Brown discovers that if he places the solder gun on his left side and the number of wires he needs for his shift on his right side, he can solder more pieces than anyone else on the line. His entire line is paid an incentive based upon their entire performance. He tells the rest of the workers on his line his discovery. They each practice what he tells them, and see that it does indeed seem to cut down on the time to solder the wires. The rest of the line, then, adopts his new practice. For the next six months Joe's line receives the greatest incentive in the plant.

The following model (**Figure 2**) depicts the complex adaptive system in which the ATTC effort is embedded:

**Figure 2**  
**The Complex Adaptive Systems into which the ATTC is Embedded (Model 1)**

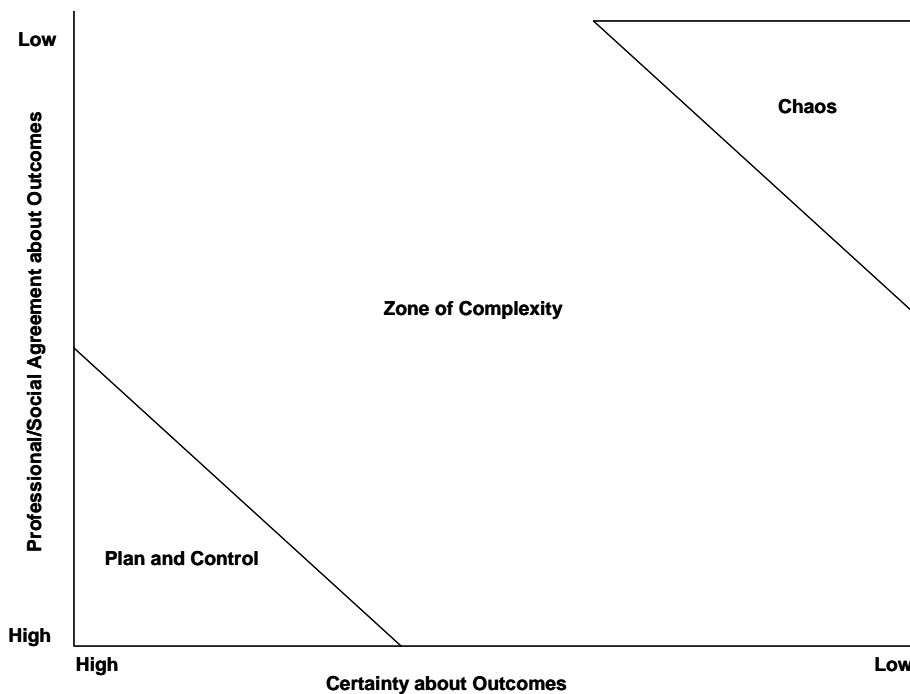


The above figure describes the domains impacting the substance use disorder treatment system. Each domain has a complex array of systems and influences that simultaneously impact a treatment system or program either directly or indirectly. The figure presents these domains in a nested manner, but it should be noted that the influence of a factor within any one domain may disproportionately affect factors within that domain or within other domains.

1. The **Federal System** is comprised of funding and support, evidenced by service and research funding, the regulatory oversight from which laws and regulations that impact substance use disorder treatment are developed and promulgated, the national-level treatment and patient advocacy efforts that influence policy development, and the national level research findings that influence practice and policy.
2. **State and Community Systems** include funding and support, evidenced by service and research funding disseminated in whatever configuration the state selects, the regulatory oversight from which laws and regulations that impact substance use disorder treatment are developed and promulgated, state-level treatment and patient advocacy efforts that influence policy development, state level research findings and evidence that influence practice and policy, and the state and local norms and beliefs that influence practices and policy within a community, region or state.
3. **Organizational Systems** are comprised of organizationally-specific resources and influences that affect how a program provides substance use treatment.

Understanding that the substance use disorder treatment system is complex can, at first, make us pessimistic about ever effecting a sustained change. However, a growing number of articles describe strategies for achieving impacts within a complex system. (IOM, 2001) The literature on complex adaptive systems suggests that as professional/social agreement about an outcome (as result of an action) and certainty about outcomes (what we want to occur) become enhanced, our ability to plan and control the complex system under study improves (see **Figure 3**) (Katz & Kahn, 1966; IOM, 2001). Still, the complex adaptive system in which substance use disorder treatment resides will never yield total professional/social agreement about an outcome or certainty about specific outcomes. But, as leaders in the field, we can work together to **enhance** our ability to plan and control this system.

**Figure 3**  
**Complex Adaptive System**



One way of exerting additional control and planning upon a complex adaptive system is to identify the major components of this system that result in significant levels of control (i.e., movement) when high levels of agreement and certainty exist. We submit the following as the major components of the complex system the ATTC wishes to impact.

1. Leadership
2. Performance Measurement
3. Internal/External Learning
4. Model for Change

Briefly, these components would translate as follows in our work with the ATTC:

- 1. Leadership.** The literature strongly suggests (e.g., Commonwealth Fund, Issue Brief #724) that as the leadership in all elements and levels of a system agree upon a common vision and attendant principles, the ability to change that system increases. The pivotal role of leadership, upon defining its vision, is to remove the barriers that prevent achievement of this vision. Moreover, there is evidence to suggest that the closer the vision is to the ideal, the quicker system change can occur. The ATTC could collaboratively develop an overarching vision, and require that each grantee build upon this vision. Moreover, the ATTC could provide training and technical assistance to stakeholders within the system domains on how to develop and implement a vision that can support positive change. There are other aspects of leadership that are important to guiding and sustaining change within complex adaptive systems. (Fray EN, 1988; Browning J, 1993; Milsom J, 1991; Barner RW, 1989; Doherty EM, et al, 1989) The ATTC can take its own leadership role in guiding the development of such leadership throughout all levels of the system described above.
- 2. Performance Measurement.** Every action within the ATTC should be measured in a manner that reflects its vision and the goals of the action under study. Performance measures should be collected in the course of the work, reported back to those involved in real time and analyzed in a one-by-one problem-solving manner. The ATTC could take the lead in developing performance measures for the application of training efforts that permit real-time problem solving and change, and for other processes such as evidence-based practice application (in concert with NIH researchers and other stakeholders), sustaining collaborations across system levels, and so on.
- 3. Internal/External Learning.** Internal Learning. Another way to build sustainable change within a complex system is to standardize how that system will learn ways to better reach its intended vision. These internal learning strategies involve the use of performance measurement data and the use of standard learning strategies such as found in industry (i.e., Alcoa Business System, NIATx, etc.). Thus, ALL work within the ATTC would follow established rules. The ABS's rules of use are as follows: all work must be highly specified as to content, sequence, timing, location, and expected outcome; every customer-supplier connection must be simple and direct, and there must be a binary, yes/no method to send requests and receive responses; the pathway for every product and service must be predefined, simple, and direct, with no loops and forks; and any improvement must be made using the scientific method, under the guidance of a teacher, and close in time, space, and person to the problem and toward the ideal. An important aspect of internal learning is shared learning experiences. The ATTC can develop its own shared learning experience (learning community) by which it discusses and establishes learnings (through the results of its performance measurement system and standardized work processes) that can be implemented throughout the ATTC network or within specific ATTCs. External Learning. External learning strategies involve the ability of the ATTC to **effectively** increase the awareness, knowledge and skills of its target audience, stakeholders, and membership necessary to solve the problems that stand in the way of achieving its intended mission.
- 4. Model Application.** All of the ATTC's work and the above activities (1-3) must be applied against a common model that integrates principles of wellness and recovery with

prevention, intervention, treatment and recovery management. The development of such a model is being facilitated by the NeATTC's PI (and IRETA Executive Director) Michael Flaherty.

### C. Application of the Models 1 and 2 to the ATTC Activities (Model 3)

Using the work of Rogers (1995) and others (IOM, 2001) and focus group results conducted with providers within the Northeast ATTC region, and integrating the concepts of a complex adaptive system with the methods of increasing the ability to change this system, we submit the following application of the model described above. The following model suggests that the role of the ATTC is to be the **nexus** from which existing and new information, imparted via training/information dissemination vehicles, are provided to the substance use disorder treatment field. This should be done in a manner that permits self-directed use and leads to continuously improving mechanisms for applying evidence and science to healthcare and related services. The model suggests that the ATTC's role is to leverage existing information/technology transfer vehicles and carefully strategize how to develop new vehicles in a way that greatly enhances an individual provider's opportunity to adopt practices that improve the care he/she provides. The model would include resources that span its region (and the national network); thereby providing a resource to each state that is greater than it could develop singularly. Interestingly, this is the model suggested for all of health care in the IOM's 2001 report "Crossing the Quality Chasm: A New Health System for the 21<sup>st</sup> Century." The following model recognizes that the activities in this field exist within a complex adaptive system (**Model 1**), and must be conducted through strategies that follow those suggested by **Model 2**. The following are additional features of this proposed approach. These features are presented briefly, but could be enhanced during a planning phase (See Section X, below.).

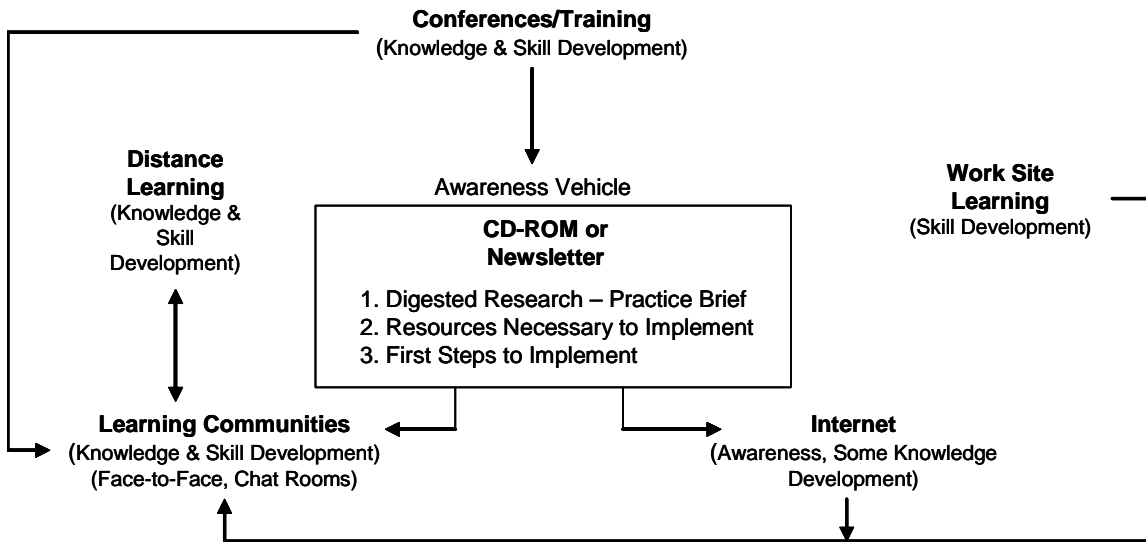
- 1. Model Variations.** Based on our understanding of complex adaptive systems, the proposed model must be applied in a way that meets the greatest needs of each state's treatment system. For example, the topics and evidence-based model presented can vary based upon the state treatment system's available resources and experience with innovations. Items 2 and 3 (below) suggest ways that federal and state priorities (needs) and resources can be assessed prior to implementing this model.
- 2. Baseline Innovation Assessment.** Each state within a given ATTC's region would be assessed to determine the degree to which evidence-based practices have been implemented within its provider system, the degree to which research efforts work collaboratively with the provider system, and the degree to which computerized technology is available to the treatment system. Though the method for conducting this assessment is not readily available, we suggest that a core group of ATTC and NIDA team members could design a short- and long-range plan for this assessment.
- 3. Stakeholder Involvement.** The proposed model would require that each ATTC develop a stakeholder group comprised of the respective state director's office, provider advocacy/representation groups, selected researchers and other policy makers (as desired). At first, this group would be responsible for determining it's the state treatment system's greatest need for information/technology. This group would also work with its ATTC in evaluating and improving the model implemented and/or available to each state.

4. **Target Audience.** The primary target audience for the information/processes is substance use disorder providers who, with the patient, are the most critical partners in a long chain of mandates, priorities, expectations and accountabilities.
5. **Vision.** Each stakeholder group will be required to develop an articulated vision for the ATTC that is synergistic with the overall ATTC vision (not to be mistaken with mission), and involves several agreed-upon principles from which the vision will be realized (**Model 2**). The ATTCs will be instructed to make this vision as close to the “ideal” as possible, and to use a process of coalescing the stakeholder group around the ideal to begin making progress. The ATTCs will be provided technical assistance in this function.
6. **Awareness/Knowledge/Skills – a Conceptual Model.** The model suggests a conceptual model from which adoption can take place that, at first, involves classifying all activities as to whether they are intended to increase the participant’s awareness, knowledge or skills (**Appendix A**).
7. **Tailoring the Approach to the Needs of the Target Population.** The work of Rogers (1995) and others (IOM, 2001) suggests that the manner in which one approaches someone with an innovation should take into account where that person stands with respect to their experience with implementing innovations and in understanding how the innovation might meet their needs. Therefore, efforts to increase participant awareness of specific evidence-based practices should be tailored to each adopter’s style and to the level of persuasion necessary to motivate the participant to seek additional information/knowledge (i.e., to demonstrate knowledge adoption).
8. **Efficacy versus Effectiveness.** Through the use of performance measurement systems and internal learning strategies, the ATTCs could work with evaluators and researchers to present strategies and models that support efficacy (the strategy appears to work) and effectiveness (the strategy works across interventions). The results of these systematic inquiries could be used in ATTC-focused learning communities (discussed above) that present strategies that appear to be **suggestive, probable and established in real time (i.e., advancing the system as it learns)**. **In some cases, qualitative understanding will be the bridge between evidence-based practice and progress.**
9. **Opportunities for Collaboration with NIH.** Current NIH-funded research has not been implemented with significant penetration throughout the substance use disorder treatment system. The proposed model, incorporating the concepts contained in (See below.), provides the opportunity for NIH researchers to learn the “problems” (qualitative and quantitative) the field is experiencing in achieving excellent care, and to learn how to apply existing evidence-based practices and research-based strategies (in a less manner reductionistic than in the past) to rapidly solve these problems and effectively adopt evidence-based practices.
10. **Fidelity and Adaptations.** The proposed model, incorporating the concepts in Section B, provides a platform from which the ATTC could collaborate with researchers to understand how to apply adaptations to practices and programs suggested by qualitative and quantitative research methodologies with sufficient fidelity. The use of performance measurement data described in **Model 2** (either specific to the model being applied or to

the intended outcome of the application) can be used to ensure acceptable levels of fidelity and understand more about the impact of adaptations.

- 11. Evaluation Considerations.** The proposed model suggests new methods of evaluation that involve the integration of empirical and qualitative methods and the rapid application of these methods in a feedback loop (à la an action research model). (Santalainen TJ & Hunt JG, 1988; Worthen et al, 1996)
- 12. Special Focus ATTCs.** Again following the IOM’s suggested model, each ATTC could be mandated to commit its efforts and resources to being “expert” in one or more aspects of the model. Thus, other ATTCs can turn to these ATTCs for technical assistance and support when developing their own program.
- 13. Emergence.** Emergence is a new concept being applied in physics and biology that proposes the principles that guide a system’s development are best understood in the organization of its components, not in its smallest elements (Katz & Kahn, 1966; Laughlin RB, 2005). Much of our research takes the latter, reductionistic perspective, and these authors suggest that it is little wonder the results of this research cannot be applied in the real world. The ATTCs could take a leadership role in developing this concept for our field, and paving the way for future research and “technology transfer” activities to make a difference, unlike they have in the past!

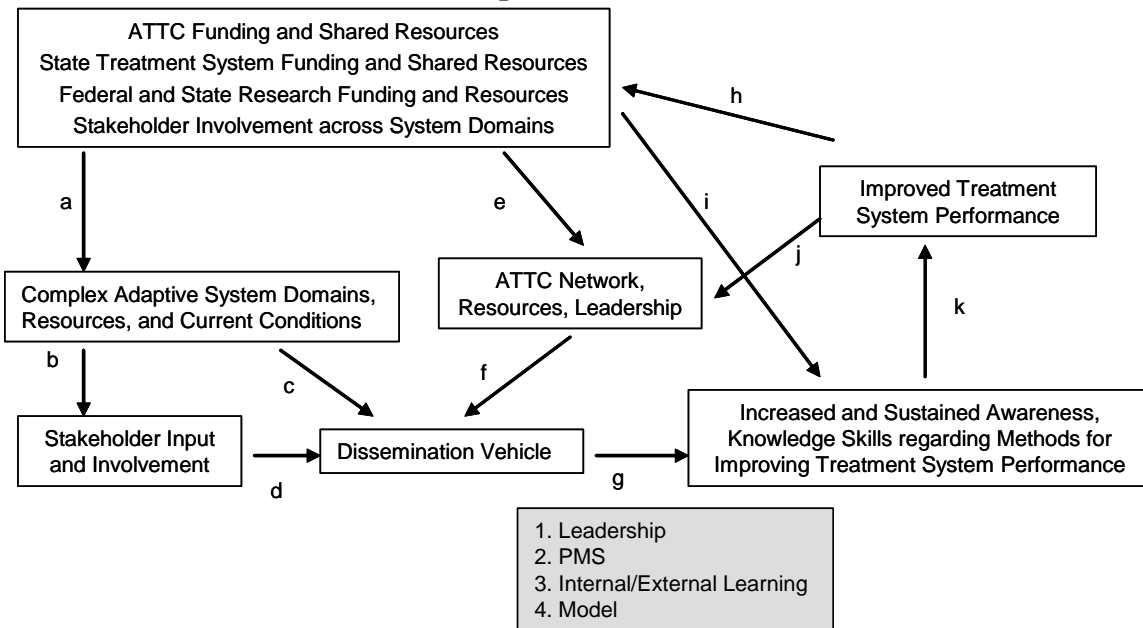
**Figure 4**  
**Proposed NeATTC Dissemination and Support Vehicle**



## D. Proposed Impact Model

The following is a proposed impact model that incorporates each of the above three models and presents a framework by which the ATTC can evaluate its ability to impact the system of care at all levels depicted in **Model 2**.

**Figure 5**  
**Impact Model**



This impact model demonstrates how elements of the complex adaptive system and stakeholder involvement can be used to develop dissemination vehicles that meet the principles described in Model 3, above. The impact model further suggests that, upon implementation of this vehicle using the components described in **Model 2**, we can expect increased **and sustained** awareness, knowledge and skills regarding methods for improving each state's and each ATTC region's treatment system performance. The result of this sustained increase in awareness, knowledge and skills will lead to improved treatment system performance, which in turn will provide additional resources and learnings that can be used to improve the dissemination vehicle and enrich the state, provider and ATTC resources.

The above impact model would be implemented using the four strategies contained in the shaded box. The impact model suggests that the ATTC would need to emphasize ways of enhancing the impact of increasing and sustaining awareness, knowledge and skills regarding methods of improving treatment that would lead to improved treatment performance. Obviously, in order to accomplish this, the ATTC must partner with the treatment system, State Director's office and other stakeholders. Moreover, as indicated by Holder (Holder, 1998), the processes that occur between each action or condition of the impact model (indicated by letters) can be broken down into intermediate outcomes, which can in turn be measured. The immediate outcome becomes a key method for ensuring the ATTC's efforts remain "on track".

## **E. Next Steps**

The NeATTC would be willing to co-host a meeting with members of its regional NIDA blending initiative to present this model and approach. We will have our evaluation component collect the comments from the participants regarding what they see as strengths or limitations of what is proposed. The results of this meeting could become a project presented by NeATTC to the overall network for consideration. At this meeting we suggest that someone like Harold Holder be a keynote speaker. The first meeting is scheduled for June, 2005.

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