

Application of the Human Function Model

When decisions are being made about the provision of transition services for individuals with disabilities, a major issue is the problem the person has in functioning within his or her environment. For example, a woman with cerebral palsy may lack the fine muscle control that will permit her to fasten buttons so that she can get dressed independently. A man with a visual impairment may be unable to use printed material that is required to perform his job. A college student, due to an unknown cause, may be unable to solve math problems. Similarly, someone who has been in an automobile accident may have a severe head injury that has impaired his ability to speak clearly.

In each of these cases, a demand has been placed on the person from the environment to perform some function that will be difficult to execute because of a set of unique circumstances or restriction in the functional capability caused by the lack of personal resources. For example, the above people lack the physical or mental capability to button, read, calculate, or speak.

All of us face situations daily in which environmental demands are placed on us. Our goal is to understand the processes and relate them to the lives of exceptional individuals who face more complex and restrictive situations. There is the need to know many things, such as the nature of the demands that are being placed on the individual from the environment and how those demands create the requirements to perform different human functions, such as learning, walking, talking, seeing, and hearing. It is important to know how such requirements are - or are not - being met by the person and how factors such as the person's perceptions and the availability of personal resources such as intelligence, sight, hearing, and mobility can affect the responses that can be made. In addition, it is important to understand how availability of external supports, such as therapy, and technology can impact on the individual's ability to produce functional responses to the environmental demands.

Although each exceptional individual will be unique, the common challenge is to identify and apply the best possible array of educational, rehabilitation, technology, and related services that will provide support, adjustment, or compensation for the person's functional needs or deficits. A variety of responses may be appropriate. For example, Velcro fasteners may be used to replace buttons on garments for the woman having difficulty with buttoning. Braille or audio materials may be provided for the man who cannot read conventional print. The student who has difficulty calculating may require specialized, intense direct math instruction, while a computerized device that produces speech may enable the person who cannot talk to communicate.

The Unifying Functional Model

The unifying functional model displayed in Figure 1 has been developed to illustrate the different elements of life associated with a functional approach to special education, transition services, rehabilitation, and related services, including the provision of medical, instructional, information, and assistive technologies. When examining this model, note that the items in each box are meant to be illustrative and not all-inclusive.

The following example illustrates the elements of the model, their interrelationships, and how it can serve as a framework for making decisions about technology: Ann is a high school sophomore with learning disabilities, who is planning to attend college. Although she has above-average intellectual ability, Ann experiences difficulty with written composition and spelling, plus her handwriting is difficult to read. Her reading rate is slow and she experiences some difficulty in comprehending written material, although her understanding of spoken information is excellent. Ann receives most of her education in regular classes with support from a special education resource teacher, who also consults with Ann's other teachers about ways to ensure that Ann will succeed in her college preparatory course. Those responsible for developing a transition plan for special education also have been involved in making decisions about ways to best prepare her for her college experience.

Let's begin with the box at the bottom of the model, labeled environment and context. Those involved in transition planning for Ann are concerned with two environments. One is her prospective college environment, the other is her current high school environment. The context is that she will eventually find herself in an academic setting that requires certain skills that must be applied independently. She must develop those skills and learn how to apply them while she is still in high school.

The environment and context place functional demands on all of us. Although a host of issues could be addressed related to the demands placed on Ann, those related to technology will be highlighted, since that is the focus of this article. The demands that will be placed on Ann will include the necessity to read and comprehend the written materials that she will encounter in college. Due to the amount of reading that is required, she will need to read that material as rapidly as possible. She also will need to prepare written compositions, reports, and answers to examination questions. It also will be incumbent upon her to prepare written materials that are legible and have correct spelling.

In preparing to make response to environmental demands, people explore options that are available to them that will enable them to respond in a constructive fashion to those demands. This typically involves assessments, experimentation with different options, and making adaptations. In Ann's case, a variety of technology-based options might be considered to assist her in meeting the demands described above. For example, to increase her reading rate, she might explore speed-reading programs or the use of machines designed to increase reading speed, such as tachistoscopes. She may explore the possibility of books recorded for people with visual impairments or reading difficulties as an alternative to reading. Another option would be the use of a scanner to convert printed text to computer files that could be read aloud through speech synthesis. She may pursue the use of hand-held spelling checkers and the use of word processing computer programs that incorporate spell-checking features. She also might investigate the possibility of obtaining instruction in the use of learning strategies to help her develop good study habits.

One's personal perceptions play a big part in exploring response options and making a decision about which option to accept. For example, some people may, or may not, perceive that a need exists or that they have a problem. People also have perceptions about the psychological, physical, and monetary costs of different alternatives and their consequences.

A second factor in making decisions about response strategies relates to the personal resources that people have available to them. These relate to their abilities in areas such as physical functioning, cognitive ability, intelligence, motivation, speech, and other personal dimensions which can be used in producing actions.

A third factor influencing decisions relates to the external supports a person has available. Supports are resources available to assist individuals in responding to environmental demands. For example, family members can provide both emotional and physical support. They also may be able to provide interpretations of their child's or sibling's personal perceptions when a disability interferes with their ability to communicate reactions and preferences. Social service agencies can provide supportive services, such as instruction about ways to cope with environmental pressures. Health insurance agencies can sometimes provide financial support for the purchase of assistive and adaptive devices. Special education and transition services are another major form of external support, as are the use of technology devices and the delivery of various technology services.

Let's see how all of these areas impact on Ann. In the area of personal perceptions, Ann realizes that she has a problem with reading, composition, spelling, and handwriting. She also has a fierce desire to do things for herself and "fit in" with her fellow students.

In the area of personal resources, Ann and her teachers know that, although she has several learning problems, she is bright enough to master course content. She is particularly adept at learning and remembering information that is presented orally.

In further exploration of options, she decides against using the scanner and speech synthesizer due to the complexity and cost of the equipment and the time involved in scanning text and converting it to computer files. Although this might be an option for later, the decision is made to start with more realistic options.

The functional response is the result of the assessment, experimentation, and decision making that was just described. In Ann's case, this will be instruction about how to efficiently use a tape recorder to play back and learn from audiotapes of recorded texts. [This option was selected because Ann could qualify for the federal "Talking Book" program that would enable her to get audio recordings of books she would be using in college.] It also was decided to provide instruction on how to use a word processing computer program that is equipped with a spelling checker, text to speech converter, and grammar checker. Her resource teacher also will teach her how to use learning strategies to facilitate studying. These provisions are written into the transition plan that is incorporated into her IEP.

As a result of the functional response to the environmental demand, personal changes occur. Such changes may be dramatic or subtle, depending upon the nature of the environmental demand, the decision making that was done, and the nature of the resources that were expended and the supports provided.

Following evaluation after the implementation of the transition goals within her IEP, it was found that our student, Ann, improved her ability to function in her current academic environment by using audio tapes and computer software productivity tools to participate in her classes. Feedback (as represented by the arrows emanating from the evaluation and feedback element of the model) also may lead to the selection of additional technologies. For example, word prediction software and the use of macro programs that automatically type frequently used words and phrases may be added to her repertoire. As Ann matures and gains confidence in her abilities, she may eventually elect to experiment with scanning devices that will enable her to convert printed text to audio formats.

Thus, the process represented in the functional model becomes a dynamic one, in which demands constantly change, as do personal perceptions, personal resources, external supports, and examination of alternative solutions. The result is new functional responses to the environmental demands that lead to

personal changes, which in turn, have the potential for modifying all of the other factors illustrated in the model.

Note that the model, as presented in this two-dimensional format, represents a “snapshot” of a person’s situation at a single moment in time. As such, it does not reflect the fact that changes are constantly occurring in each component and that these changes have the potential for impacting on the other components and subsequently on the functional responses made by the individual.

The final features to note in the model are the shaded areas in Figure 1. These represent personal variables. As was just noted, the model, as presented, is two-dimensional. However, the central focus is the individual and the decisions that are involved in assisting that individual in responding to environmental demands. That process is certainly complex and more than a two-dimensional one. Additional examples of how the model can be applied to people with different disabilities, different degrees of severity, and different ages are provided by Blackhurst and Berdine (1993) and Blackhurst and Lahm (1999).

The human function model is the underlying philosophy of the University of Kentucky Assistive Technology (UKAT) Toolkit. Forms have been developed to guide individuals and teams through the assistive technology service delivery process. Each of the forms relates to one or more areas of the human function model. Figure 2 illustrates which UKAT form(s) address which aspect of the model. The specific UKAT forms are indicated in shaded boxes to the left of the model elements with arrows pointing to the affiliated functional area, i.e. the consideration form looks at functional demands. When moving through the process of delivering appropriate and quality AT services all of the factors of the unifying functional model are addressed.

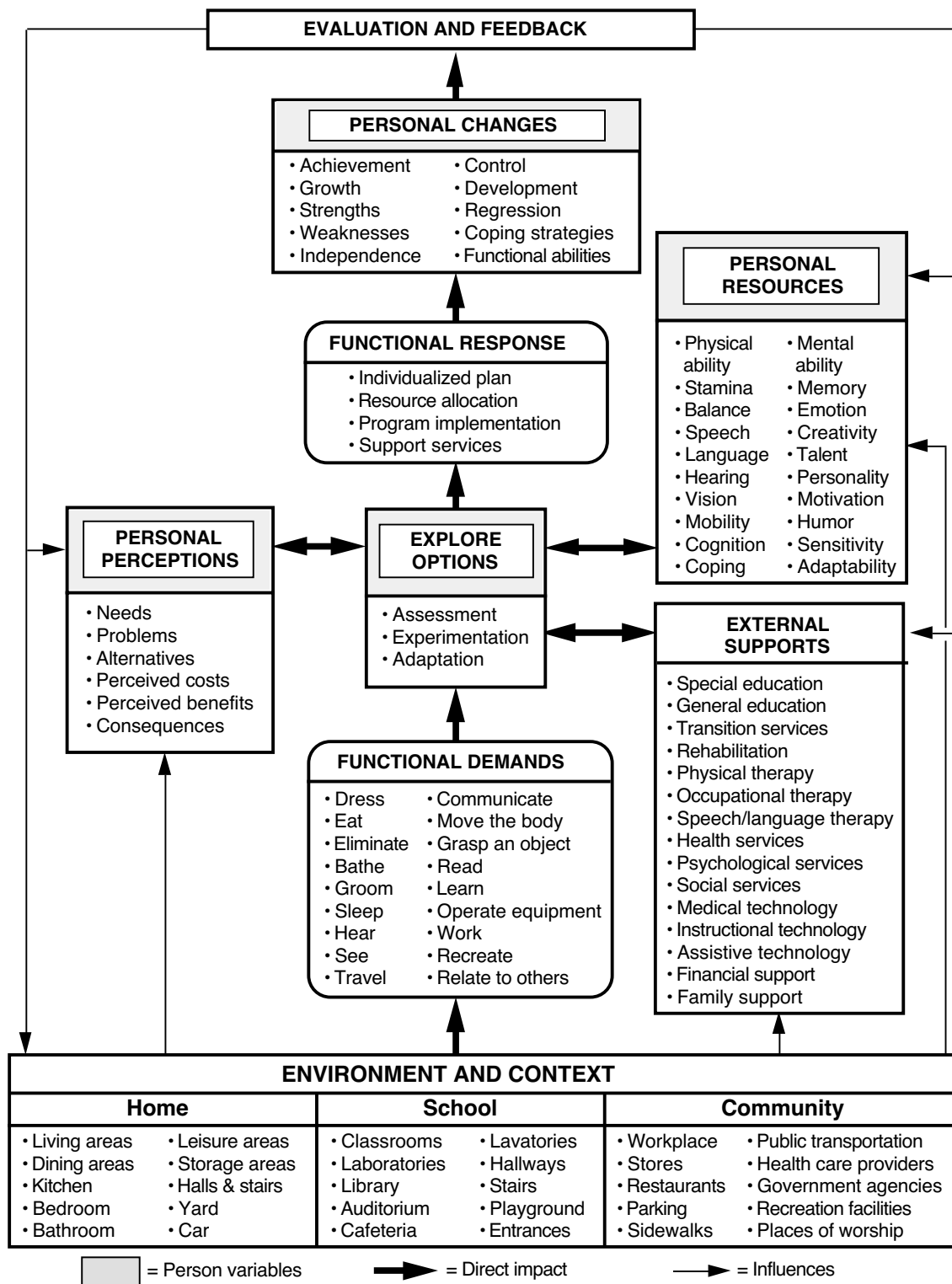


Figure 1. Human Function Model

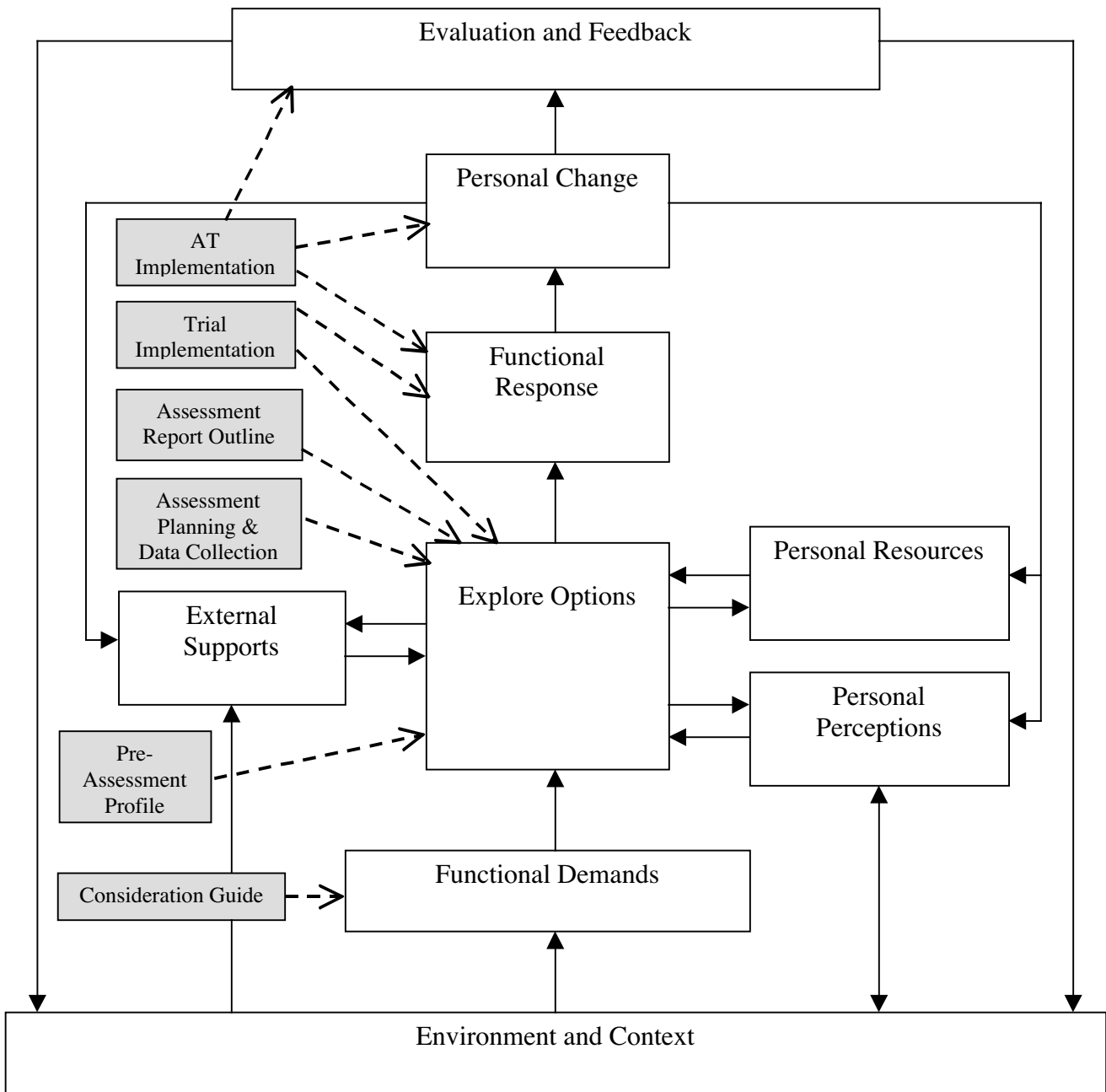


Figure 2. Simplified Human Function Model with UKAT Toolkit forms integrated.