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Introducing the Human Development-EcoLogic Model: A Practical Approach for Outreach and Extension Education Programs

Abstract

To reach the goals of outreach and Extension programs, a program planning model is essential. A new model is presented to ensure program success; it is the human development-ecoLogic model (HD-ELM). The HD-ELM components are as follows: HD—human development characteristics and implications for target audience; E—modified ecological systems theory, or the surrounding systems that influence program participants; and LM—revised logic model (objectives, inputs, outputs, outcomes, and program assessment). Users of the HD-ELM can account for missing gaps that prevent programs from being successful by addressing the target audience's developmental characteristics and the surrounding systems in which programs exist.

Keywords: human development-ecoLogic model, ecological systems theory, logic model, human development, program planning

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Introduction

After reading the title of this article, you might be thinking 'Why do I need a new model for planning programs?' or 'What in the world is the human development-ecoLogic model?' The human development-ecoLogic model (HD-ELM) is a new approach for planning, implementing, and evaluating all types of outreach and Extension education programs.

There are many program planning models used in outreach and Extension education. These include the conceptual programming model (Boone, Safrit, & Jones, 2002), the targeting outcomes of programs model (Rockwell & Bennett, 2004), the logic model (Taylor-Powell & Henert, 2008), and the interactive model (Caffarella & Daffron, 2013). These models are helpful for addressing technical elements of programs such as needs assessments, program objectives, curricula, outputs, and outcomes. However, they do not always lead to achievement of desired objectives and outcomes for outreach and Extension educators. On the basis

of my observation of, research about, and experience with outreach and Extension programs for over two decades, I propose that there are three primary reasons programs do not reach their full potential or fail to make a difference:

1. *Human development life stages and characteristics of the target audience are not considered or are only minimally considered.* Many of the aforementioned models were developed for adult education. Although these models are often applied to programs for younger audiences, unique aspects of younger audiences are not recognized within the models. When developmental stages are disregarded, challenges confront program implementers. These challenges may occur when participants are involved in program activities that are either developmentally too difficult or not demanding enough, leading participants to become discouraged or bored.

2. *The context or environment in which the program is implemented is ignored.* Programs do not exist in a vacuum; rather, they are situated within community environments and affected by familial, cultural, and other factors. Lack of awareness among program planners and implementers about what is happening in participants' lives can affect how participants respond to and take part in outreach and Extension programs.

3. *Program planning models focus only on technical aspects of the program.* For example, when program planners use the logic model, the focus is mostly on the technical aspects of planning a program, such as curriculum choice or delivery method, without addressing the developmental characteristics of the target audience. In addition, other technical components such as program objectives and assessment are often implied rather than clearly identified.

The HD-ELM addresses these problems. The HD-ELM accounts for (a) the developmental stage of the target audience through intentional focus on human development, (b) the surrounding environment of the program and participants through a modified ecological systems theory, and (c) the need to establish clear objectives along with inputs and outputs for program outcomes and impacts through a revised logic model.

Research Background

The HD-ELM consists of three key components—attention to human development (HD), a modified ecological systems theory (E), and a revised logic model (LM)—and is informed by established theories and models pertaining to these components. The following sections highlight the research basis for each component.

Human Development

The human development component is related to the target audience element in existing program planning models. The target audience is frequently described through program participant demographics such as age, sex, and ethnicity. However, human development characteristics related to cognition, emotion, motor skills, and social skills of the target audience are often only a minor focus in the previously cited program planning models.

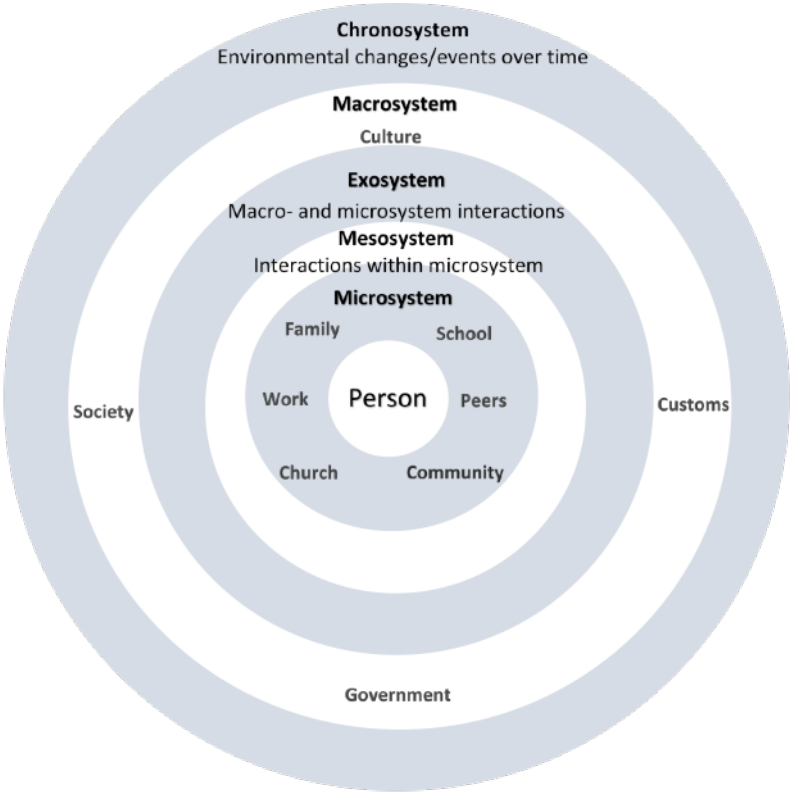
Outreach and Extension education programs reach participants in every stage across the life span—infancy,

childhood, adolescence, young adulthood, middle adulthood, and late adulthood (Berk, 2013). There are also characteristics within domains of development (e.g., cognitive, emotional, physical, and social) that are present in each stage (Sigelman & Rider, 2014). It stands to reason then that human development life stages and characteristics have important implications for planning and implementing outreach and Extension education programs. If programs are not developmentally age appropriate or do not account for human development characteristics, even the best intended programs will fail. In the HD-ELM, human development life stages and characteristics are viewed as critical.

Ecological Systems Theory

The ecological systems theory, developed by Bronfenbrenner (1979, 2002, 2005) and widely used in the fields of family studies, social work, and human development, emphasizes the critical role of the contexts in which individuals develop. The individual's environment is described as five systems: microsystem, mesosystem, exosystem, macrosystem, and chronosystem. Figure 1 is a construction of Bronfenbrenner's (1979, 1986, 2002) model showing the five systems.

Figure 1.
Five Systems of Ecological Systems Theory



The microsystem contains the elements closest to the target audience, such as family, peers, neighborhood, and a program itself, that impact the developing individual. The mesosystem comprises interactions among features within the microsystem and the person that directly affect the person's development (e.g., parents–teachers, peers–person). The exosystem contains the interactions between and within elements of the different systems that externally or indirectly influence the person (e.g., government–community, work–family). The macrosystem is the overarching outer system that consists of customs, cultural facets,

and governmental factors that may influence all systems as related to the target audience and program. This system may be especially crucial with regard to government funds (e.g., funds for programs serving youths from military families). The chronosystem consists of environmental events and transitions that may impact individuals over time. For example, a divorce or death of a family member influences developmental trajectories and has long-lasting effects after the actual event occurs.

The ecological systems theory is particularly helpful because programs do not exist in isolation. Outreach and Extension education programs are part of communities and their surrounding systems, which include family, neighborhood, government, and culture. Developers of program planning models have indicated that these external factors are important to consider, but they have not focused on the specifics of how programs are influenced by the external environments in which they function (Caffarella & Daffron, 2013; W. K. Kellogg Foundation, 2004). The HD-ELM accounts for the significant influence of surrounding environments on a program and its target audience.

Logic Model

The logic model has been used for many years by outreach and Extension education organizations to guide programs via a 'logical' framework (Workman & Scheer, 2012). The logic model consists of a common vocabulary and a summary of key elements of a program that are usually depicted in a graphical figure.

Key elements of the logic model include inputs (investments—time, money, materials, volunteers, etc.), outputs (target audience and activities—workshops, in-services, etc.), outcomes (short term—learning, medium term—action, long term—conditions), situation (needs assessments), and external factors (Taylor-Powell & Henert, 2008; W. K. Kellogg Foundation, 2004). External factors are related to the systems addressed in the ecological systems theory, but treatment of these factors in the logic model lacks the depth and detail present in the ecological systems theory.

A strength of the logic model is the emphasis on evaluation and what to evaluate. Another asset of the model is the distinction between activities (outputs) and impacts (outcomes). However, the traditional logic model lacks other technical components such as program objectives or program assessment. The HD-ELM is based on the use of a revised logic model as the technical basis for planning programs.

Components of the HD-ELM

As I have noted, the components of the HD-ELM are attention to human development (HD), a modified ecological systems theory (E), and a revised logic model (LM). A graphic depiction of the HD-ELM is shown in Figure 4 later in this article; to understand the HD-ELM, however, it is necessary to understand the Extension context for each component and the contribution of each component to the HD-ELM.

Attention to Human Development

Existing research supports the significant role that human development life stage and characteristics have within Extension programs. A few examples are as follows: (a) age significantly influenced farmers' willingness to enter into a manure exchange agreement program (Battel, 2006); (b) participation by youths (4-H and FFA members) in an animal science–related career development program was strongly related to self-efficacy (Lancaster, Knobloch, Jones, & Brady, 2013); and (c) the emotion of felt exclusion was a factor

limiting youth participation in 4-H and other youth programs in underserved communities (Avent & Jayaratne, 2017).

Given the evidence that human development factors can affect target audience members' involvement with Extension programming, it is a short leap to imagine how accounting for human development factors in program planning might increase the likelihood of a program's success. For example, consider an outdoor 4-H summer camp program for youths in kindergarten through sixth grade. Activities have been structured to involve softball and fishing as options for participants to select for their morning activity. Several younger children choose softball, and it is discovered that they do not have the eye-hand coordination to make contact with the ball. After a couple of innings with many strikeouts and 'boring' play, the children have had enough. If developmental abilities had been considered before implementation of these activities, alternatives, such as using a batting tee to hit a stationary ball, could have been put into place. Another scenario might center on planning and conducting field demonstration tours for farmers and stakeholders. Information collected at program registration could include not only participant contact information but also information about special needs so that participants who have physical limitations related to accessing the field plots could be effectively accommodated.

It is essential for outreach and Extension educators to tailor their programs to be developmentally appropriate according to life stage and to account for human development characteristics relative to a particular target audience. Rather than requiring the use of good judgment to account for these aspects of human development, the HD-ELM helps educators make intentional decisions regarding how to implement a program in ways that account for them. Specifically, the HD-ELM involves consideration of the life stages of potential target audiences and the associated human development characteristics and program planning implications shown in Table 1. The human development characteristics listed in the table include classifications from Erikson's (1982) psychosocial theory, Inhelder and Piaget's (1958) theory of cognition, and Sigelman and Rider's (2014) life-span human development approach.

Table 1.

Life Stages and Associated Human Development Characteristics and Program Implications

Life stage of target audience	Human development characteristics	Implications
Infancy–early childhood Birth–5 years	• Trust vs. mistrust (birth–1 year) • Autonomy vs. shame/doubt (1–3 years) • Initiative vs. guilt (3–6 years) • Locomotion and language development • Initial development of fine motor skills • Sensorimotor and preoperational thinking	• Build trust • Use calm approach • Provide physical safety and emotional security • Use imitation and repetition • Allow play and manipulation of

		objects
	• Play learning, same-gender playmates	• Engage senses with visual, tactile, auditory, and motor stimuli • Use stories, simple pictures • Use positive reinforcement
Childhood 6–11 years	• Industry vs. inferiority • Physical advances • Peer group socialization • Importance of friendships • Initial responses to rejection and group pressure • Concrete operational thinking	• Encourage active participation • Be honest, help with fears • Provide group activities and cooperative learning • Allow time for questions • Use logical explanations • Establish role models
Adolescence 12–18 years	• Identity vs. role confusion • Puberty, sexual experimentation, rapid physical development • Autonomy development • Formal operations, abstract thinking • Formation of personal values • Increased seriousness about school • Peer importance, tolerance of others who are different	• Provide for flexibility and experimentation • Negotiate changes • Identify control focus • Use peers for support and influence • Make activities meaningful to participants' lives • Allow for participants' input and independence
Early adulthood 19–39 years	• Intimacy vs. isolation • Postformal thinking • Independence and departure from home	• Recognize social roles • Allow self-direction • Focus on application to participants' work and life worlds

	Education completion and full-time work • Intimate relationships, marriage • Parenthood	• Draw on participants' experiences • Recognize family and peer systems • Allow participants to set their own pace
Middle adulthood 40–64 years	• Generativity vs. stagnation • Physical changes, vision decline, beginning of menopause, male/female hormonal changes • Height of career • Children and parent involvement • Mortality awareness • Cognition changes in areas of verbal memory, perceptual speed	• Support life goals • Allow participants to maintain independence and life patterns • Recognize potential life stressors • Relate to and value life experiences • Focus on practical applications of program goals and objectives
Late adulthood 65 years and beyond	• Ego integrity vs. despair • Transition and adjustment to retirement • Physical strength and health decline • Death of partner/spouse • Reflection on meaning of one's life • Reinvention of oneself with new goals, challenges • Sensory ability, information processing, and memory decline • Chronic illnesses	• Relate information to daily life • Build on past life experiences • Allow time for processing • Increase safety of program activities • Encourage active involvement • Keep learning sessions focused and short • Provide breaks and periods of rest as needed • Establish realistic goals

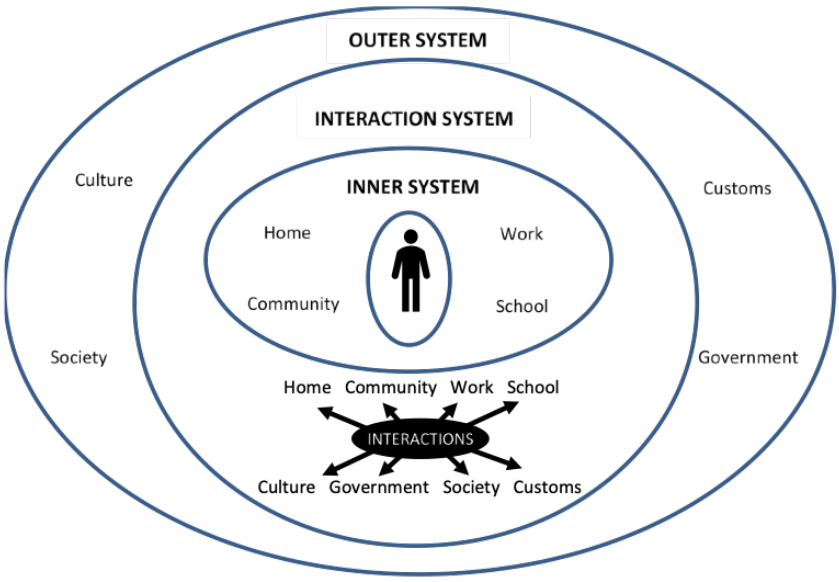
Modified Ecological Systems Theory

As with aspects of human development, the research literature has established that Bronfenbrenner's (1979, 2002, 2005) ecological systems theory is an effective theoretical approach for outreach and Extension education. Professionals in the family and consumer sciences program area in particular have used ecological models to help address factors that influence the Supplemental Nutrition Assistance Program (Korlagunta, Hermann, Parker, & Payton, 2014), health and wellness efforts (Rodgers & Braun, 2015), and preparation of professionals for work in family and consumer sciences (Franck, Wise, Penn, & Berry, 2017).

Unfortunately, there has been confusion about using and understanding the ecological systems theory whereby important implications of the theory are overlooked. On the basis of their study of published articles, Tudge, Mokrova, Hatfield, and Karnik (2009) reported that many researchers had misunderstood or improperly used the ecological systems theory. In a follow-up study, researchers reached similar conclusions regarding inappropriate use and description of Bronfenbrenner's ecological systems (Tudge et al., 2016).

I developed a modified version of Bronfenbrenner's theory to include as a component of the HD-ELM, with the intent being to make its application easier and to strengthen its relevance to outreach and Extension education programs. The modified ecological systems theory, depicted in Figure 2, has three systems rather than five: inner system, interaction system, and outer system. The inner system is comparable to the microsystem, and the outer system is comparable to the macrosystem. The interaction system represents both the mesosystem and exosystem that directly and indirectly affect the developing individual, indicating interactions of components within and between systems. The chronosystem is accounted for by participants' experiencing environmental events over time. The three systems—inner, interaction, and outer—influence both the program and the target audience.

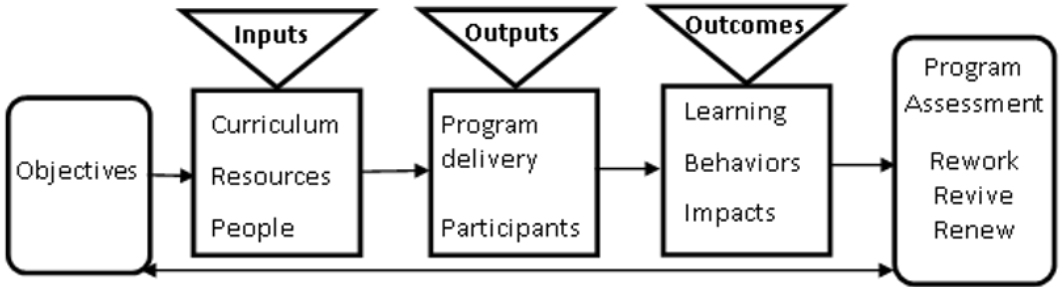
Figure 2.
Three Systems of the Modified Ecological Systems Theory



Revised Logic Model

As noted previously, application of the logic model is common in outreach and Extension efforts, and much empirical evidence exists regarding its usefulness in generating effective programs, from 4-H science programs (Lewis & Worker, 2015) to horticultural therapy programs (Di Nardo, 2007), for example. A revised logic model is the center of the HD-ELM and provides the basics for planning, delivering, and evaluating outreach and Extension education programs. This revised logic model includes the usual inputs, outputs, and outcomes components but also includes objectives and program assessments. The objectives component is directly related to the outcomes component, which addresses the process of change in human learning (short-term), action or behaviors (medium-term), and impacts (long-term), whereas the objectives state the desired program goals. Intentionally adding program assessment ensures that programs are evaluated or assessed for the purposes of improving (formative evaluation) and proving (summative evaluation) their effectiveness. The program assessment element refers to data or evidence that shows how well the program is implemented and is reaching its desired objectives. Because of the added program assessment feature, HD-ELM programs are continually 'reworked, revived, and renewed,' the intent being to ensure that assessment is intentional rather than assume it will happen. Figure 3 illustrates the revised logic model.

Figure 3.
Revised Logic Model



HD-ELM: Putting It All Together

The HD-ELM is a comprehensive program planning model that can be used to develop new programs or modify existing ones. It consists of three key components:

1. *Attention to human development (HD).* A program's target audience must be understood according to audience members' life stage(s) and developmental characteristics.

2. *Modified ecological systems theory (E).* The surrounding environment must be considered—not just the program environment, but participants' family, neighborhood, work, and other contexts and ways in which these contexts enhance or deter achievement of program objectives.

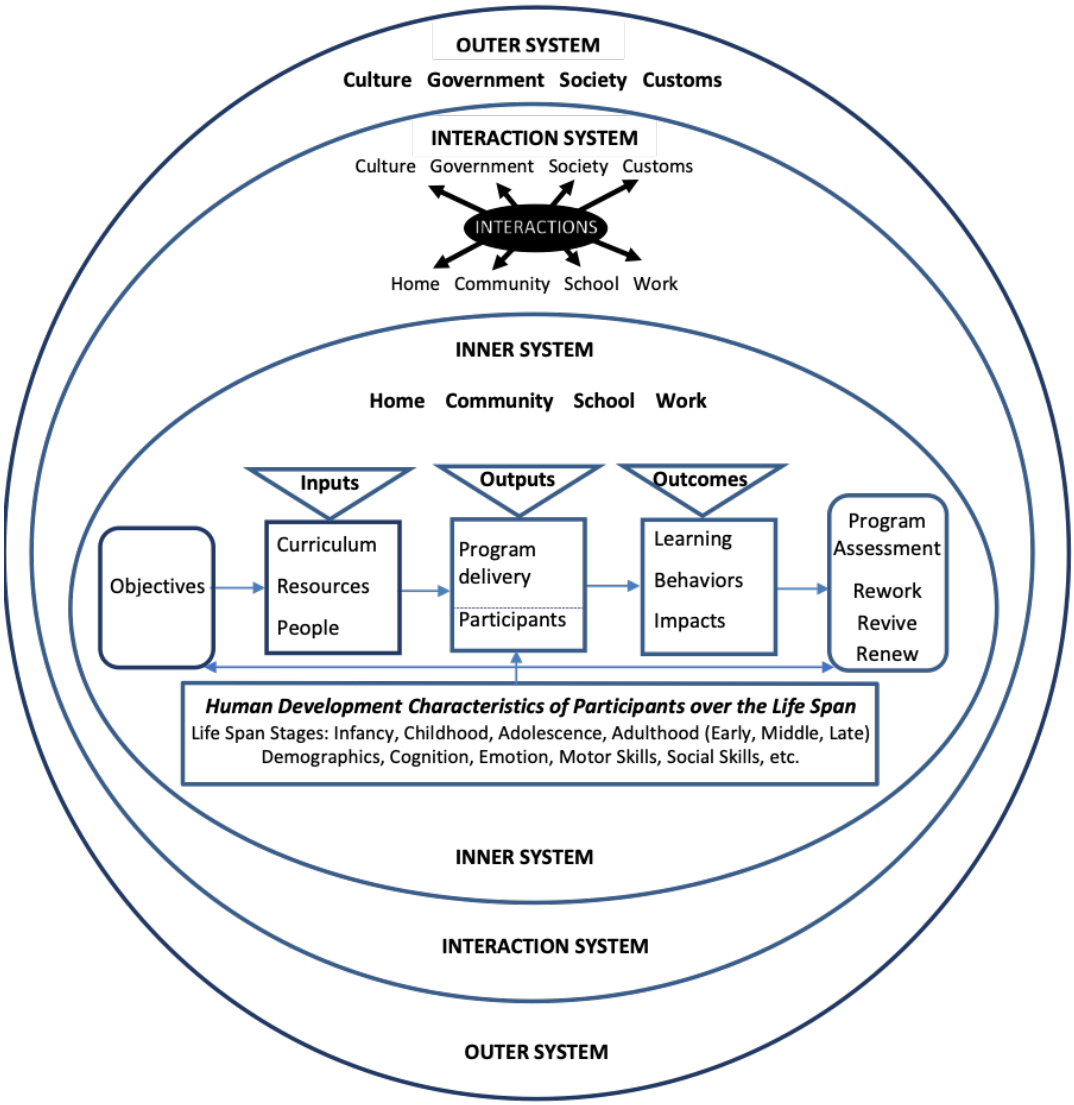
3. *Revised logic model (LM).* A program framework must be used to identify what the program goals are (objectives), what is needed to make the program successful (inputs), what the program is doing (outputs), where the program is going (outcomes), and what worked and what did not (program assessment).

In the previous sections, each of these components was explored with regard to its empirical validation in

the research literature and importance for outreach and Extension education. The HD-ELM is a representation and integration of these components into one comprehensive model for greater program success. The HD-ELM is represented in Figure 4.

Figure 4.

Human Development-EcoLogic Model



In the HD-ELM, the participants of a program and the revised logic model are at the center of the model. The outputs component describes what happens within the program (e.g., activities, workshops, events) and who participates. The line connecting the outputs component of the revised logic model and the human development life span stages and characteristics indicates that human development life span stages and characteristics are connected to the participants of the program.

Surrounding the participants and the revised logic model are the inner, interaction, and outer systems of the modified ecological systems theory. The arrow symbol in the interaction system indicates that interactions occur among all the elements represented in the model. The elements in each system do not comprise an exhaustive list; rather, they are examples of elements that exist within these systems. All elements may interact with one another, meaning that interaction occurs not just between the inner and

outer systems, but within systems. For example, 'home' can affect involvement in one's 'community' in terms of the effects of the demands of family life. Thus, a parent who is a master gardener may need to limit involvement in an Extension agricultural and natural resources program to allow for more parenting time.

Another unique aspect of the HD-ELM is the feedback loop denoted by the bidirectional arrow connecting the objectives and program assessment features of the revised logic model. As programs are planned, implemented, and assessed over time, they are in continual rework, revive, and renew processes often involving formative and summative evaluation.

Application of the HD-ELM

Each component of the HD-ELM is supported by the research literature for application in outreach and Extension education programs. The HD-ELM will be better understood as educators use and test the model with their own programs. I have used the HD-ELM for several years, primarily with a program for younger 4-H members for which I have provided statewide guidance. In this program, we accounted for the target audiences' human development characteristics, the contexts in which the program functioned (ecological systems), and the technical program plan components, all of which were critical for the program to be successful and reach its objectives (Scheer, Yeske, & Zimmer, 2011).

Use of the HD-ELM by program planners does not need to be complicated. If a logic model is used already, it can be a starting point for incorporating the other HD-ELM components. The first step would be to identify the target audience's human development characteristics and the program implications of those characteristics. In addition, both human development abilities and disabilities of the program participants are valued in the HD-ELM. The next step would involve examining the ecological systems (i.e., inner, interaction, and outer systems) and how the elements within the systems (e.g., family, peers, communities, government) may influence the participants and the overall processes of the program. In the final step, the program planners would apply the revised logic model. Undertaking these steps is as straightforward as answering three questions:

1. What is the life stage, or what are the life stages, of the target audience (e.g., childhood, adolescence, late adulthood), and what are the associated human development characteristics (e.g., demographics, cognition, emotion, motor skills, social skills, etc.)?

2. Which systems (i.e., inner, interaction, outer) and elements (e.g., family, peers, community, culture) most strongly influence how the program functions?

3. How would the revised logic model in the HD-ELM guide planning, delivery, and evaluation of the program while accounting for the target audience and the surrounding systems?

A major advantage of the HD-ELM is that it is flexible; users do not need to follow it exactly as described. For example, professionals who already account for the influence of ecological systems in their educational programs (Kim, 2016; Rodman, Sheppard, & Black, 2008) could incorporate other components of the HD-ELM as needed.

The HD-ELM is a stand-alone model, but using it does not preclude the value of using additional theories

that explain other aspects of human behavior and learning. The model can be used in conjunction with other models and theories, such as the experiential learning model (Kolb, 1984) or diffusion of innovation theory (Rogers, 1963, 2010), to strengthen program planning and impact.

The HD-ELM is a blueprint that educators, practitioners, and youth leaders can use when planning, implementing, and evaluating programs for their outreach and Extension education programs. Program objectives are achievable through knowing the human development characteristics of target audiences along with the systems surrounding participants.

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