

**Using Roger's Adoption Diffusion Attributes as a Precursor for Extension Program  
Development: Implications for Educators and Climate Science Specialists**

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# Using Roger's Adoption Diffusion Attributes as a Precursor for Extension Program Development: Implications for Educators and Climate Science Specialists

## Introduction/need for innovation or idea

Program development has a long history in Extension. Early efforts on program development dates back to the 1940's when Taylor (1949) proposed a three-step (plan, do, and review) model. Since Taylor's model, several experts (Boyle, 1981; Boone, Safrit, & Jones, 2002; Caffarella & Daffron, 2013; Franz & Towson, 2008; and Seevers & Graham, 2012) have discussed program development models keeping in mind the changes that have occurred in Extension. Consensus from these discussions suggest that the goal of program development is to facilitate changes in knowledge, attitude, skills and behaviors (KAS-BC) through a systematic process. As Extension professionals are involved in disseminating information on innovations, new practices, tools, and ideas that have social, economic, and cultural impacts, it is important to understand the ways in which an innovation or a new practice may be accepted into a group. Using Roger's adoption-diffusion theory (Rogers, 1995), Extension professionals and program developers can determine the parameters that assist an innovation that is being introduced and accepted to the target audience. Therefore, it is critical to study the application of Roger's (1995) adoption-diffusion concepts to the program development process, particularly when innovations/new program are complex, and to some extent controversial, for example, climate change.

As climate change researchers and educators are developing new decision-support tools (DST) to adapt or mitigate climate change issues, a need exists to examine each DST as it relates to the attributes of an innovation. It is important to understand the attributes of innovations and how that facilitates with climate change adaptation and mitigation efforts. Through the development of a checklist using innovation attributes can assist in the program development process and facilitate the adoption or acceptance of a new tool or innovation.

## How it works/methodology/program phases/steps

We examined Roger's three concepts of adoption-diffusion theory: (1) adopter categories (innovators, early adopters, early majority, late majority, and laggards), (2) stages of adoption process (awareness, interest, evaluation, trial, and adoption), and (3) innovation attributes (relative advantage, complexity, compatibility, observability, and trialability) to develop a checklist that incorporates these concepts into the program development process (see Figure 1).



Figure 1: Roger's (1995) Concepts of Adoption Diffusion Process

A checklist comprising of 50 items (10 items for each of the five attributes) was developed to reflect the innovation attributes. We suggest that program developers use this checklist as a precursor to developing new tools or programs. Such use will help proactively identify the problems/issues relative to a new tool or program or innovation. Further, use of the checklist will also help make corrections as the program is being implemented, thereby serving as a process evaluation tool.

An example of the checklist for the attribute, Relative Advantage is provided below (see Table1).

Tool developers are asked to indicate the extent to which the statements were considered in

developing the tool by checking YES or NO in the column to the right. The greater number of “YESs” each statement has, the greater the chance of the DST being adopted.

Table 1:

**Relative Advantage:** *the degree to which an innovation is perceived as being better than the idea before it*

<b>Did you consider the following <i>Relative Advantage</i> characteristics in development</b>	<b>YES/NO</b>
1. Information relative to economic profitability	
2. Information on reduction in production costs	
3. The extent the tool saves time	
4. The extent to which additional skills are required to use the tool	
5. Relative ease in using the new tool compared to the existing ones	

Comments:

### **Results to date/implications**

We share challenges and opportunities from our experience in dealing with communicating a complex innovation relative to a climate change program in the Northeastern U.S. This checklist has been used on a small scale with a few decision support tools developed to assist in the adaptation-mitigation efforts. Use of the checklist has provided opportunities to tool developers on how to integrate innovation attributes into program development. Results from the use of checklist reveal that program developers have not considered many of the attributes before developing the tool. The checklist has given them an opportunity to consider a few attributes to contemplate in the future development of new DSTs. Taking proactive steps in the developmental stage to incorporate innovation characteristics will go a long way in making the DST acceptable to the target audiences’ social, economic, and cultural characteristics. Communication among tool developers and stakeholder groups is key to successful adoption of DST. The checklist is designed to facilitate the communication among key stakeholders.

### **Future Plans/advice to others**

We will continue to refine and modify the checklist for a variety of tools developed to address adaptation and mitigation efforts. We will share this with Extension educators involved in climate science so that they can engage with stakeholders to get input for developing the tool or program. Another plan is to put the checklist on a web platform so that all developers can modify and use it depending on their specific program needs. A long-term plan is to conduct a research study to show attributes of an innovation as a significant predictor of adoption of new tools or practices. Perhaps an experimental research to study the effectiveness of the checklist and DST adoption should be conducted.

### **Costs/resources needed**

Costs/resources needed is very minimal. Initial development of statements/items for each attribute may be challenging and/or time consuming. Once the items for each attribute is identified and developed, the next step is to get this validated by experts. Collecting data using the checklist may add to the cost but is minimal.

## References

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