**Learning 2-Way Audio and Its Impact on Communication
within Needs Assessment Group Processes**

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Distance Learning 2-Way Audio and Its Impact on Communication
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(ABSTRACT)

There is a significant amount of literature on needs assessment group processes and distance learning. There is practically no literature on the affects of using distance learning technologies to facilitate needs assessment processes. This study takes a look at the participation of professionals in a needs assessment using distance learning technologies, the affect it has on their communication anxiety in small group settings using the Communication Anxiety Inventory, and their impressions of the process.

Participants used a computer with internet connection and a telephone to take part in the assessment. Three small group needs assessments were conducted. Participants were administered a survey that measured their trait (typical) anxiety score, conducted through the needs assessment, and were administered a survey that measured their state (actual) anxiety score during the assessment and their impressions of the process. Those with low trait anxiety tended to experience an increase in anxiety in this environment while those with high trait anxiety had a decrease in anxiety. It was inconclusive as to whether or not anxiety was a factor in participants contributions to the group process.

All participants were willing to participate in this type of needs assessment again. They found the assessment outcomes valuable and the method in which it was conducted convenient. This would seem to indicate that participants felt the impact of using 2-way audio and distance learning tools was minimal but a larger and more diverse study is necessary in order to make any generalizations.

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CHAPTER ONE

Introduction

This study builds the rationale for using distance learning technologies to facilitate communication between needs assessment focus group members and describes the affect that such technologies have on their participation. Many professionals agree with the value of conducting a needs assessment when engaged in problem solving. Needs assessment methods are well established and a review of the literature suggests there has not been a significant change in the overall process in several years (Burton & Merrill, 1991). When conducting a needs assessment, the two most common forms of gathering data are the survey and group processes (Witkin & Altshuld, 1995). While participation in surveys will not usually have an adverse impact on professionals' day-to-day business activities, group processes can, especially if travel is required for participation. In some cases, the organizations or individuals that are the target of the needs assessment (e.g. professionals, organization, state or federal agencies, communities, instructors, learners, or any other type of individual or organization that could be considered a stakeholder) are decentralized and frequently face time and distance-related constraints.

Advancements in the area of distance education may offer solutions to some of the logistical problems. A great number of technological advancements have been made in communication, forecasting, and problem solving. Many of these technologies are now in regular use for conducting meetings and their use to facilitate these group processes would seem to be a logical extension (Witkin & Altshuld, 1995). However, there was nothing in the literature that described how this change might affect an individual's participation in the group process. Because their participation is important to having a successful group process, being aware of such affects would very helpful in designing the group process and deciding if such communication technologies should even be used.

Context of the Study

The Office of Economic Development at Virginia Tech was tasked with providing economic development assistance to communities throughout the state of Virginia. As a part of their reorganization, they wanted to perform an assessment of the types of economic development needs of near (close to Blacksburg) and far (close to Bristol and Lee County) Southwestern Virginia. There was a desire to conduct a series of focus groups to better identify the regions' economic development needs to help better focus Virginia Tech's efforts in those regions. The stakeholders in the region were geographically diverse and the focus groups would need to be conducted using distance learning technologies to accommodate schedules and facilitate communication among participants. The use of distance learning technologies in this setting and participants experiences in the process was the focus of this research.

Out of this study emerged a contemporary definition of needs assessment, a list of current distance learning technologies, a synthesis of how these can be tied together, and a clearer understanding of how practitioners who engage in needs assessment would be impacted by this synergy.

This literature review is organized into two main sections dealing with needs assessment and distance learning. The first section starts by providing a general concept of the needs assessment process followed by a definition of need. This definition provides the foundation for detailed discussion of the process as well as some of the current trends, benefits, and pitfalls in needs assessment. Finally, the review concludes with a detailed analysis of needs assessment data gathering techniques, a summary of some of the available assessment models, and a discussion of relevant empirical research.

The second section covers distance learning technologies. Rather than examining specific technologies, it examines distance learning technologies in terms of the types of interaction that occur when technologies are employed to facilitate communication. It then draws lines between these interaction types and the needs assessment data gathering techniques. Finally, it reviews empirical research related to the varying technical abilities of those interacting with technology due to age or accessibility.

Needs Assessment

Solving problems is an integral part of everyone's life. One example might be an instructor looking to provide training on a new concept or a business executive trying to determine why there is an abnormally large turnover rate in the accounting department. A needs assessment process provides a methodical and organized approach to problem solving. Needs related to the problem must be identified and ranked in importance while shortfalls must be identified for future action. Kaufman and English (1976) provide a general definition of needs assessment as:

> a formal collection of the gaps, the placing of the gaps in priority order, and selecting the gaps of highest priority for action and resolution. (p. 20)

Another way of looking at gaps or needs is to consider them problems to be solved. Instructors or business executives must also examine the problems they face and prioritize them based on their importance and resources available. These professionals must always work to fulfill the needs and expectations of their respective stakeholders, learners, or stock holders. From an organization's point of view, doing so has become a necessity in ensuring organizational success (Kaufman, 1992, 1998; Popcorn, 1991).

The first step must be to identify and understand the problem and determine whether or not the resources are available to solve it. Polya (1957) suggests that one should enter the process by asking two questions: "What do you want? What do you have?" The answer to "What do you have?" is known as the "initial (or starting) state" while the answer to "What do you want?" is the "goal state" (Newell & Simon, 1972). The difference between these is referred to as a "gap" or "need". But what exactly is the true "gap" or "need"? As will be shown, the devil can be in the detail.

Gap/Need

When attempting to identify a need, one of the greatest sources for confusion can be simply defining need (Scriven, 1991). Without this clear understanding, the needs assessment process will fail to meet expectations because they are not realistic to begin with. (Watkins *et al.*, 1998).

In its simplest form, the most common definition used in the literature identifies "need" as:

> The gap between current and desired (or required) results, or (stated another way) the gap in results between "what is" and "what should be" (Triner *et al.*, 1996, p. 52)

This definition of "need" is sometimes referred to as the discrepancy definition (Kaufman, 1972, 1988, 1992) with its roots dating back over 50 years (Tyler, 1949).

Burton and Merrill (1991) point out three important considerations regarding the discrepancy definition and needs assessment. First, a discrepancy must exist for a need to exist. For example, an employee may say he needs more money. If his salary has been lowered or if he receives less money than his peers who have performed equally well, then a discrepancy exists. However, if his income remains in line with that of his peers, the expressed opinion of the employee does not reflect the actual situation. The second idea involves the measurement of the discrepancy. The results of the measure will only be as accurate as the tool used to make the measurement. Suppose a measure is made of an employee's salary and that of her peers and the results show a discrepancy indicating the employee is being paid less than others with the same job description. If the measurement instrument fails to take into account seniority or past work experience as a factor, a discrepancy may be indicated where one does not really exist. The third idea has to do with what should or ought to be. This is really a judgment call by those conducting the assessment and is shaped by the values of the assessor. What makes it even more challenging is that the further out into the future the projections go, the greater the chance there will be an error in identifying what ought to be. While the assessors may reach a consensus on what ought to be now, a sudden burst in growth and migration of people into the area may change those dynamics in ten to twenty years. A hundred years ago, the concept of women participating in the governing process was a novel concept. Today, it is normal to see women holding positions of authority throughout all branches of the government.

Sources in the literature suggest that the discrepancy definition is the most widely used in the professional community (Kaufman & English, 1979; Scriven, 1991). However, Scriven (1991)does offer some dissenting views on earlier revisions of the discrepancy definition. Referencing the 1972 written form, he points out that the gap is referred to as the difference between the actual and the ideal. The point of contention lies in the use of the word "ideal". To illustrate, one's ideal method for commuting to work (say a 10 minute helicopter ride) on a daily basis may not be the one that is most practical or appropriate (perhaps a 25-30 minute commute by car). The ability to determine the "ideal" goal state can be quite difficult. What is ideal for one may not be ideal for another. A second point he chooses to take issue with is the concept of unmet needs. The suggestion is that one should also consider met needs and suggests that instead of met and unmet needs, they should be considered maintenance and incremental needs. Maintenance needs are those needs that have already been addressed and incremental needs being those that will ultimately require action. The reason this distinction is suggested is because when thinking about the eventual implementation necessary to address those incremental needs, there is a risk that resources may be taken away from maintenance needs to fulfill incremental needs. (see the "Needs Assessment" section later regarding needs assessment and implementation).

One of the common mistakes made in a need assessment is that the assessors often focus on the solution or means rather than the actual gap or ends, identifying "what

is" and "what should be". Drucker (1974) suggests that it is the difference of "doing the right things" and "doing things right". In other words, it is like a cure looking for a disease. This idea is highlighted further by looking at how the word "need" is actually used (Kaufman, 1986; Kaufman *et al.*, 2002a; Kaufman *et al.*, 2002b; Witkin & Altshuld, 1995). The common mistake is the use of need as a verb, indicating action. Consider these two examples:

1. A car needs gas to continue running.
2. Company X needs two-way video conferencing systems to deliver in-house employee training at a distance.

In both cases, a course of action is being proposed. A better use of the word "need" is as a noun. This indicates a problem state that compares where one is to where one wants to be. Using the previous examples, a better way to state the need would be:

1. A car has a need of a source of energy to continue running.
2. Company X has a need to reduce frequent travel costs related to employee training.

Here, only the problem is identified. The needs assessment should define and prioritize the problems, not identify solutions. In the first car example, the only solution would be to use gas as the fuel. What if the better solution was to use a hybrid fuel, such as ethanol or a totally different source of fuel, such as electricity? In the training example, the first attempt suggests that two-way conferencing is ideal. What if the use of e-mail/correspondence, web, or one-way video broadcast is just as effective?

It is also important to have a clear understanding of the audience and the type of need that is being considered. Bradshaw (1972) and Burton and Merrill (1991) collectively identify six different types of social need: normative, felt, expressed, comparative, anticipated, and critical incident.

A normative need is when there is a discrepancy between that which is being considered and the established norm, standard, or average. Consider a steel mill that manufactures I beams. If the mill fails to produce steel without sufficient quantities of specific required elements, the product will fall below industry standards necessary to meet established tensile strength requirements. Normative needs can also be derived from social indicators. An applicant for food stamps is either approved or denied assistance on need. That need is measured by income and accumulated wealth. If it falls below the minimum standards set by the agency administering the program, food stamps are awarded. The further the applicant is from that baseline standard, the greater the number of stamps that will be awarded. A bank will measure a loan applicant's debt to asset ratio and monthly income against a set of standards to determine loan qualifications.

A felt need is associated with a desire or want. This type of need would certainly seem like a desirable method for assessing needs. Unfortunately, felt need often has a significant risk associated with it. As mentioned earlier, what a person, group, or organization wants is not always the same thing as what is needed. Consider a self-employed individual who manufactures an expensive medication in high demand and who states the need for a new boat. What is the motivating factor behind the desire to buy the boat? If it is because the individual has always wanted to learn how to water-ski, this is probably not something that is really needed. However, what if a key ingredient in the manufacturing process comes from a type of fish? The boat might be a way to cut costs related to acquiring raw materials, allowing the expansion of production, and reducing

the cost to the end consumer. The desire to buy the boat now takes on a different meaning.

An expressed need is similar to a felt need except that the need for the group or organization has progressed to the point of action and readiness to undertake the steps necessary to fulfill that need. Consider again the example of the businessman who wants to purchase a boat to gather raw materials. Perhaps a potential competitor enters the market and the added threat of competition makes the businessman willing to take the necessary steps to purchase the boat to reduce costs and protect his market share. Another example might be the bread lines in Russian often seen during the time of Communist rule or the gas lines of the 1970s America. In both cases, people were willing to wait in long lines for significant lengths of time to receive what they desired.

A comparative need occurs when two similar groups or organizations do not receive the same service. Suppose you have two equally economically depressed counties with similar demographics that want to improve their economic standing through international exports. One has a small local airport that has been designated as a free trade zone where goods can be flown out with greater ease in terms of paperwork and tariffs. The other county does not have an airport with this designation and must use traditional channels for transporting exports from their county. Therefore, a comparative need exists. It does not necessarily mean that the county who already has free trade zone status does not need additional economic assistance to aid with competition in global trade or that it has the best solution for fulfilling the need. It could be that the products being produced locally are not economically feasible to ship in large quantities via air. It could be that neither locality has rail service to a port and that the better solution to their need would be the establishment of rail service which could make product transportation easier and more cost effective.

Anticipated needs are needs that are expected to occur in the future. A town is experiencing significant growth and is building a water treatment facility capable of supplying all current residents and businesses. The plans for the plant ensure that it will be able to handle the current demand. However, the town should also assess potential future growth and build in capacity to meet future needs. If these future needs are not anticipated, the plant will become obsolete almost as soon as it is completed.

Critical incident needs are concerned with sudden or unexpected failures which identify needs that had gone unnoticed. The terrorist attacks in the United States on September 11, 2001 highlighted several such needs. The fact that so many terrorists were able to seize multiple planes emphasized significant problems in airport security. When structural beams supporting a floor gave way in each of the World Trade Center towers, a domino effect occurred, bringing down both towers and demonstrating an obscure but significant structural design flaw that must be considered in future buildings that use a similar design. Difficulties experienced by emergency medical services and law enforcement trying to communicate and coordinate efforts using incompatible radios highlighted the need to have a more sophisticated communication system in place.

Beyond types of needs, Witkin and Altshuld (1995) add the dimension of levels of need. They suggest that there are three such levels: Primary (service receivers), secondary (service providers), and tertiary (resources and solutions). These can be put into perspective using an internet service provider such as America Online as an example. A subscriber is the recipient of the services an internet service provider offers. Routers,

servers, modem banks, and internet applications represent resources and solutions. A typical needs assessment is designed to look at the needs of the service receiver. However, it is important to bear in mind that these customers should not be the sole focus of a given study. There are many other elements involved in the process. For example, those delivering the service may need better training to trouble-shoot technical issues end users encounter, there may be insufficient modems to handle incoming service requests, or application services might be failing to meet end users expectations.

As can be seen, the concept of need has many facets that must be taken into consideration. Only with a clear understanding of need and how to best apply it to a given situation can one proceed to the designing and conducting of a needs assessment program.

Needs Assessment

While the name and methods may have changed depending on where and when it was used, the concept of a needs assessment or gap analysis has been around for quite some time with a history that goes back to the 1950's (M. L. Moore & Dutton, 1978). While the literature seems to agree on a general consensus of the definition of "need", there is considerable confusion in seeking the definition of "needs assessment". One possible definition is offered by Rossett (1987) which defines "training needs assessment" as:

> A systematic study of a problem or innovation, incorporating data and opinions from varied sources, in order to make effective decisions or recommendations about what should happen next. (p. 3)

One of the potential problems pointed out with this definition is that while the text goes on to explain that training is not automatically the solution, many make the mistake of assuming that it is because the word "training" appears in the title of Rossett's book (Triner et al., 1996). The wording, however, is somewhat vague leaving much to be interpreted by the reader. A similar definition comes from the works of Kaufman which identifies a needs assessment as:

> a tool for (1) identifying the needs or gaps between current results and desired or required results and (2) prioritizing the gaps according to the difference between the cost of closing them and that of ignoring them (Kaufman, 1972, 1994, February, 1996, 1998, 2000; Kaufman et al., 2002a)

This definition offers greater precision in that it more clearly defines needs and gaps as a part of the process, as well as adding the concept of the cost of doing something versus the cost of doing nothing.

Often, the needs assessment systematically analyzes organizational and/or individual performance (Stout, 1995). This leads to one of the common areas of dispute regarding a needs assessment. Specifically, where the process should or should not stop. In both of the above definitions, methods for addressing needs are not chosen and actions are not taken to achieve the desired change. Consider this definition:

> A systematic set of procedures undertaken for the purpose of setting priorities and making decisions about program or organizational improvement and allocation of resources. The priorities are based on identified needs (Witkin & Altshuld, 1995, p. 4)

It recommends going further than merely identifying the gaps and prioritizing them. Determinations about improvement are made and allocations are considered. Taking a look back at Scriven's (1991) issue with the discrepancy definition and unmet needs, this concern is borne out due to concerns about implementation to address needs. While this desire to go into implementation on some level does appear periodically in the literature, the majority of authors on the subject of needs assessment do not recommend including implementation as part of the needs assessment process.

Another suggested consideration when conducting a needs assessment is the scope. In the past, businesses would typically conduct an assessment in the context of the needs of the organization and individual/group, also referred to as the macro and micro levels (Watkins et al., 1998). Robinson and Robinson (1995) refer to macro needs as business needs and provide a more detailed representation of micro needs. Collectively, they are referred to as business, performance, training, and work environment needs. Business needs are the goals or mission for an organization and can exist at the unit, department, or organization level. Performance needs are the skills needed to perform specific tasks. Training needs represent the skills that individuals do not already have and must learn in order to complete tasks successfully. Work environment needs represent the systems, processes, and/or tools that will be required or that may need to be modified in order to perform. These relationships can be seen in Figure 1.
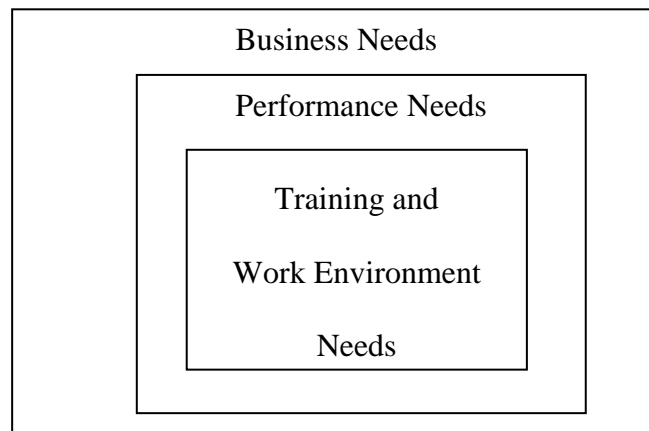
Figure 1: Organizational Needs Relationships (Robinson & Robinson, 1995, p.26)

As the needs assessment process has continued to mature, there has been growing support for considering society as a factor in conducting the assessment (Drucker, 1974, 1993; Kaufman, 1988, 1992, 1998, 2000; Kaufman *et al.*, 1998; Kaufman et al., 2002b; Popcorn, 1992). The idea behind societal, or mega level, needs focuses on the way in which the organization and individual/group interact with the community and the needs that are a result. For example, a business that manufactures widgets may want to assess the benefits of modifying their manufacturing process. However, a by-product of their current process may generate an air pollutant which, in turn, affects the community around the plant where the widgets are manufactured. In the early twentieth century, the business would have only looked at the manufacturing process in terms of the plant and those who work in it. With the rise of environmental concerns, a business may now be compelled, either by moral obligation or law, to consider the affect on the community as

a part of the manufacturing process. Similarly, a school board conducting an assessment of its service delivery in the early twentieth century might regard students in terms of skills they should have upon graduation. A modern day board would be encouraged to look beyond skills, possibly to the number of graduates who attend college or the number of students who participate in public service. The scope of the needs assessment will depend in part on the goals to be achieved and will then be dictated by the organizational level the assessment is being conducted as will be shown in the following section.

Benefits and Pitfalls

When engaging in a needs assessment, it is important to determine what the benefits will be. A successful needs assessment is not a simple process. Success requires that those conducting the program be accountable for the needs that are identified and the priorities that are set (Kaufman, 1988) and a needs assessment can help by providing documentation which illustrates why certain choices were made. Burton and Merrill (1991) build a case for needs assessment in education on the grounds of relevance and accountability. In their words, "what is taught should be useful to the individual, the community, and the country, and that educators and their systems should be held responsible for the success or failure of their efforts." (Burton & Merrill, 1991, p 18)

Klein (1971) builds a case for the idea that needs assessment can serve as a form of accountability because it has the ability to help assessors focus on the problems being evaluated. This is very important as the assessment data can be utilized to ensure that an organization's personnel and resources are used in the best and most efficient way possible. When decisions are made based on the assessment data, it is often impossible to address all of the problems presented so the assessment data can also help by providing a prioritization of the problems and the basis for that prioritization. It is this data that can be presented to the stakeholders to validate the course of action chosen. Finally, it provides a starting point from which to measure progress or change resulting from the intervention.

English and Kaufman (1975) offer a cautionary viewpoint on the notion of accountability. They suggest that accountability methods are too often applied to the means rather than the ends. Since the means are often easier to measure than ends, it can be a common mistake. "Sensible accountability is not the perfection of means; rather it is first the delineation and validation of ends, and then a systematic comparison of means (processes or techniques) defined to reach the ends." (English & Kaufman, 1975, p 4) Needs assessment should not be considered synonymous with accountability. Rather, a formal needs assessment provides the basis for measuring accountability.

Another way of looking at the issue of accountability lies in the difference between the purpose of a needs assessment and an evaluation (Kaufman, 2001). Both are created to examine gaps but for entirely different reasons. A needs assessment is designed to identify gaps and prioritize them before using an intervention while evaluation compares current results with the desired ends. Needs assessment, therefore, is best used as a planning tool that is proactive in nature. Evaluation assesses the achievements made towards closing the gaps and addresses the issue of accountability.

Burton and Merrill (1991) point out that all stakeholders should be involved in the decision-making process, not just those representing a particular point of view. This should not be done to give them a sense of belonging to the process, but because they are

connected with the organization being studied and, as such, may have useful information to contribute to the assessment. The literature clearly points to the benefits of including stakeholders throughout the process. However, Klein (1971) does caution that while it is important to involve constituents, excessive involvement up front can cause burn out later in the process. Burton and Merrill (1991) suggest that "a good rule of thumb is to involve the constituents, but do so in such a way that respects their time" (p 33).

As has been illustrated, the needs assessment process is not as simple or straightforward as one might think. Another common mistake that the literature points to is the confusion between needs analysis with needs assessment (Kaufman, 2000). The literature continually cautions against deciding the means before completely identifying the ends. Kaufman suggests considering the following three statements: "We need training," "We need to hire more engineers," "We need to get on the Web." (Kaufman, 2000, p 48) These are examples of the issue mentioned earlier concerning the use of the word "need" as a verb rather than a noun. Consider the following comment about the trend in many organizations to engage in "training needs assessment":

> Experience has shown that a training intervention is only required in one out of five performance problems – this figure is corroborated by W. Edward Deming's anecdotal modification of the Pareto Principle that 80% of all quality problems are not due to a lack of knowledge or skills (Clark, 1994) and Spitzer's observation that at least 80% of the performance problems he has encountered in his career could not be solved by instruction of any kind (Spitzer, 1990).

Needs assessment is the step that precedes needs analysis. The purpose of a needs assessment is to identify the ends to be reached. Once these ends are identified, the needs are then analyzed to identify the best means for addressing those needs and achieving the desired ends (Kaufman, 2000).

As can be seen, the pitfalls are many, but the benefits to be gained from a needs assessment are equally compelling. With these concepts in mind, it is now time to consider the various models for conducting a needs assessment and methods for gathering needs assessment data.

Current Trends in the Needs Assessment Process

As was stated earlier, the actual needs assessment process has not seen drastic change over the past thirty years. Nevertheless, an evolution in the process can be seen. One of the most significant changes has been in the increased reference in the literature to Mega or Societal needs and goals. While this concept can be dated back almost thirty years (Drucker, 1974), it did not receive significant recognition in the literature as a facet of needs assessment until the 1990's (Burton & Merrill, 1991; Drucker, 1993; Kaufman, 1988, 1992, 1998, 2000; Kaufman et al., 1998; Kaufman & Watkins, 1999; Popcorn, 1992; Watkins et al., 1998). Some organizations have begun to take into consideration the needs of society when assessing needs while others are compelled to do so by laws or regulations (e.g. – pollution emission standards) that require the company to consider the societal needs as a price for operating within a community.

Another needs assessment concept that is growing is the incorporation of costs-consequences analysis as part of the needs assessment process which offers a "coarse-grain estimate of return-on-investment" (Kaufman *et al.*, 1997; Muri *et al.*, 1998, April). Kaufman (2000) defines costs-consequences analysis as:

The process of estimating a detailed return-on-investment analysis before an intervention is implemented. It asks two basic questions simultaneously: What do you expect to give, and what do you expect to get? (p. 251)

This concept is a formalization of the second part of the discrepancy definition, prioritizing the gaps based on the difference between the expense of closing them and that of ignoring them. In organizations requiring a cost-benefit justification for action, modifications to a needs assessment may be required to gather the variables needed to perform such an analysis (Kaufman, 1998). Kaufman (2000) suggests that the organization will benefit from having a budget that is driven by strategy rather than a strategy that is controlled by the budget.

Needs Assessment Tools and Practice

Whether looking at micro, macro, or mega level, there are four core stages of a needs assessment as stated by Klein (Klein *et al.*, 1973). They are:

1. Determine the full range of potential … objectives that are advocated as worthwhile by various groups (goals or ends)
2. Determine the relative importance or value of these potential objectives to the "community" the … system serves
3. Assess the extent to which there is a need or discrepancy between desired and actual performance on those objectives perceived as important
4. Determine the final relative importance of these needs

The Course Level Needs Assessment model presented in Appendix A provides a direct representation and explanation of these steps in greater detail.

Another point of view in the assessment process can be seen by reflecting back on Kaufman's (1972, 1994, February, 1996, 1998) definition of needs assessment in which he suggested prioritizing based on a comparison of the cost of closing gaps with that of ignoring them. For example, a service provider may wish to improve customers' satisfaction with the length of time they wait on the phone before it is answered by 5%. The cost associated with adding capacity (addition of a call center or increasing of capacity at an existing call center) to answer calls could be quite expensive. On the other hand, perhaps customer satisfaction is already at 89-92% and the amount of additional sales lost as a result of not increasing response time would be minimal. Bear in mind that the means of addressing the need are still not identified at this point and the costs are not necessarily expressed in monetary terms. Consider again the earlier example of the 9/11 terrorist attack after which a critical need was identified for compatible radio systems for emergency workers. The costs to address the need by either purchasing new radio equipment or finding a way to modify existing equipment so that it is compatible would probably be monetary in nature. This must then be compared with the cost of doing nothing which could result in a greater loss of life and property should a similar incident occur.

Models

Needs assessment methods have seen various changes and refinements over time. Numerous models can be found that provide similar approaches to conducting a needs assessment with most of the differences being found in the steps and tools used to actually conduct the assessment. Watkins et al.(1998) discussed a summary review of

several models in the field. Eight of those models were reviewed in detail for the study and reviews of these can be found in Appendix A of this document. Appendix A also includes a model from the early 1970's to provide a historical reference. These models are an example of the evolution of the needs assessment process and provide a good overview of some of the different approaches for conducting a successful needs assessment.

       In reviewing the models, it was found that there are a number of viewpoints concerning the most effective way to conduct a needs assessment, each with its own unique focus and level of flexibility. Table 4, based on a table developed by Watkins et al. (September, 1998), summarizes these differences and provides a good overview comparison of the models. Selecting the right model for each situation involves a process of finding compatibility between a model's various attributes, the level of assessment (micro, macro, or mega) needed, the kind of data to be collected, and the corporate climate of the organization that will use them. Selecting the best tool for gathering data can also be a challenge and is often governed by the same kinds of criteria.

       One common factor among each of the models is that they all advocate significant involvement by members in the system or organization being assessed, though some differ in who should be involved and at what stages of the assessment. The Deductive Model and Performance Relationship Map involve the educators or managers who have direct involvement with the problem being analyzed. The Training Needs Assessment and Figuring Things Out models both use management and employees in their assessment while the Inductive and Organizational Elements models suggest that the involvement of the community or society can also be a part of the process when appropriate. The real key to success is to identify the groups who will be involved and to determine to what extent they will participate.

Table 1
Needs Assessment Literature Analysis, subset of table developed by Watkins, Leigh et al. (September, 1998)*

Needs Assessment Models	Scope									Functional Processes		
	Societal results	Organizational results	Small group results	Individual Results	Application of skills	Acquisition of skills	Reaction to intervention	Resource availability/quality	Continuous improvement	Responsiveness (proactive / reactive)	Provides tools and methods?	Data source (hard / soft)
1. Marketing Model (Nickens *et al.*, 1980)		•	•	•	•	•				P,R	•	H,S
2. Figuring Things Out Model (Zemke & Kramlinger, 1987)		•	•	•	•	•			•	R	•	H,S
3. Training Needs Assessment Model (Rossett, 1987)			•	•	•	•	•	•		R	•	H,S
4. Course Level Needs Assessment Model (Burton & Merrill, 1991)			•	•	•	•	•	•		R	•	H,S
5. Investigate the Problem Model (Arthur, 1993)		?	•	•	•				•	R	•	H,S
6. Performance Relationship Map Model (Robinson & Robinson, 1995)			•	•	•	•	•	•		R	•	H,S
7. Three Phase Assessment Model (Witkin & Altshuld, 1995)		?	•	•	•	•	•	•	•	R	•	H,S
8. Organizational Elements Model (Kaufman, 1982, 1988, 1998, 2000)	•	•	•	•	•	•	•	•	•	P,R	•	H,S

* Table key is included in column titles.

While different authors have varying thoughts on the best model, data collection method, place where the assessment should start and stop, or level/scope of the assessment, all of them agree on the value and importance of a needs assessment as a key factor in decision making process. All of the models are designed to identify needs and prioritize them, therefore, one must consider the difference among these in order to choose the one that is best suited to the organizational structure and available resources.

Relevant Empirical Research
With the number of model variants available for conducting needs assessments, one would expect to find more empirical research on the relative benefits, strengths, and weaknesses of these models. Unfortunately, that is not the case. While the literature discussing needs and needs assessment continues to grow with varying opinions on what is or is not a need or the steps to be considered as part of a needs assessment, literature performing actual comparisons continues to be elusive. Efforts have been made over the past thirty years to identify empirical data that would provide measurable results to indicate if any one method or approach might be better than another. Though usage has

shown popularity of certain models in certain arenas, such as the popularity of Rossett's (1987) model among the business community (Watkins et al., 1998), there is no empirical research to demonstrate that they have chosen the right tool for the job.

Numerous attempts have been made to either provide similar data or to at least identify research in the area over the past 30 years. Some have made attempts at comparisons based on non-quantifiable methods (e.g. Southard 1974, May, Witkin 1976). However, none have attempted to make an empirical comparison. Witkin states, "Although several models have been field tested during development, I have found no research that compares the effectiveness of one approach with another or the reliability or validity of disparate approaches" (Witkin, 1976, c.f.). Burton and Merrill (1991) attempted to locate similar work without success though they did suggest several lines of inquiry which would significantly contribute to the body of knowledge in this area such as cost-effectiveness and impact analysis. In researching this paper, this author was unable to locate any empirical research of any type on the subject. This was further corroborated in a personal conversation with Roger Kaufman in which he stated "The empirical research on different needs assessment models doesn't exist. Or at least if it has, I don't know of any." (Personal Communication, November 29, 2002)

Traditional and Contemporary Tools for Gathering Needs Assessment Data

In comparing all of these needs assessment models, it is clear that they are influenced by the special interests and backgrounds of their creators, while some of the models show influences by others. An important factor that can shape a model is the techniques used to gather the data to identify problems and find conclusions. These methods of data gathering collect two types of needs assessment data: hard data and soft data.

Hard data is data that is measurable, independently verifiable, and quantitative in nature (Kaufman, 1998). Gathering hard data is usually a straightforward process. For example, it could be retrieving census information, determining average test scores for various school districts on the same standardized test, or determining the number of defective widgets per 1000 produced. Conversely, soft data is perceptual in nature, often asking questions that require an opinion or judgment call and therefore is not independently verifiable (Kaufman, 1998). This could involve asking teachers what they think is the weakest part of the curriculum that could be causing the lower test scores or asking employees to rank the potential problems identified in order of importance. Individuals' perceptions about the situation may differ, and what they perceive may not be in line with hard data and quantifiable observations (Gilbert, 1978; Witkin & Altshuld, 1995).

In collecting data, some models use only one collection method while others use various methods combined with triangulation techniques to derive the desired results (Watkins et al., 1998). These authors point out that methods and techniques should only be selected after the needs to be assessed have been identified since they will be the key to determining how best to gather data. Warheit, et al. (1975, pp. 29-66), Rossett (1987), Robinson and Robinson (1995), and Witkin and Altshuld (1995) have collectively classified approaches for gathering data into five groupings: Key Informant, Group Processes, Record/Documentation Review, Surveys, and Observations.

Key Informants

Key informants are people who are in the group to be assessed and are in a position to know what the needs are for the group. These could be teachers in a school, line managers in a manufacturing facility, or community leaders in a locality. They are usually the first people to be contacted at the start of an assessment to help the facilitator frame the assessment and identify needs. This information gathering process is typically done through the use of interviews (Zemke & Kramlinger, 1987) which can be conducted face to face or via telephone (Rossett, 1987; Witkin & Altschuld, 1995; Zemke & Kramlinger, 1987), though Rossett points out that there is no clear rule in determining which is more appropriate as it depends on the situation. When preparing for the interview, Witkin and Altschuld (1995) suggests that there are four steps to be followed: determine interview purpose, construct interview schedule, select sample, and select and train interviewer(s).

When gathering data through an interview, it first must be decided if a structured interview or an informal/conversational interview is more appropriate. Zemke and Kramlinger (1987) assert that a structured interview is best used to "find the perceived problem and determine why people are in an uproar over it" while an informal interview can serve to "add depth of understanding to things observed or learned in other ways" such as following up on answers to surveys. Rossett (1987) and Witkin and Altschuld (1995) all concur with the use of the interview as a means for discovering the starting point(s) for the assessment. It can reveal important issues, gaps, or organizational/system factors, as well as other possible sources of information that could be helpful to the assessment process. Witkin and Altschuld do suggest keeping the interview open-ended so that the amount or kind of information received is not limited and information that might otherwise be missed is revealed.

A protocol (or schedule) should then be developed to provide the interviewer with a general format and instructions for the most effective way to conduct the interview and record answers. Next, people to be interviewed are identified. While this group typically includes key informants, it is not unusual to have a random sample of a population or a representative group of stakeholders in the organization or system being analyzed (Witkin & Altshuld, 1995). Finally, those who will be interviewers are selected and trained, keeping in mind that interviewers without personal stake in the outcome of the assessment are preferred and that researchers have found the best results are achieved when the interviewee can identify with the person doing the interview (Witkin & Altshuld, 1995).

Bringing the key informants together can also have added benefits. Nickens, Purga, and Noriega (1980) suggest that bringing together key people from various parts of the target group provides them with the opportunity to interact which can increase the thoroughness of the assessment process and improve the quality of the data being gathered. Gathering information from a group is different than using a personal interview and is conducted using an accepted group process.

Group Processes

With the exception of the written survey, the group process is the most common method used for gathering needs assessment data (Rossett, 1987; Witkin & Altshuld, 1995). Groups provide a means for face-to-face interaction among stakeholders in the

process being assessed (Witkin & Altshuld, 1995). Whether or not a group process can be considered a success will depend on the procedure, participation, and/or leadership demonstrated by the group (Scheidel & Crowell, 1979).

The literature identifies three primary forms of group processes: Community forum, nominal group technique, and focus group. Klein (1971) defines the community forum as a group comprised of individuals with various experiences representing different areas of the desired population who are randomly chosen and brought together to identify the needs of their group. Witkin and Altshuld (1995) have called the Nominal Group Technique the most common small-group technique in use. It involves a small group of people (six to ten) who have the objective of generating a large number of ideas in a brief period of time. Moore (1994) defines the nominal group technique as:

> A method for structuring small-group meetings that allows individual judgments to be effectively pooled and used in situations in which uncertainty or disagreement exists about the nature of a problem and possible solutions… [It] is helpful in identifying problems, exploring solutions, and establishing priorities. (p. 24)

This process will generate a prioritized list of ideas on a given subject.

In commenting on the third type of group, Zemke and Kramlinger (1987) suggest that "the objective of a focus group is to acquire a set of responses from a group of people familiar with a topic, service, experience, or product being discussed" (Zemke & Kramlinger, 1987). The purpose is not to gather quantifiable data but rather to identify what the group perceives as being important. Marketing research often uses this kind of technique to determine the preferences of consumers regarding a particular product or service and to identify why one may be preferable to another.

The procedure for conducting a group process consists of three primary stages: Planning, Implementation, and Follow-up (Witkin & Altshuld, 1995; Zemke & Kramlinger, 1987). Witkin and Altshuld provide recommendations for conducting each of the stages. In the planning stage, a clear purpose must be established for the meeting. Guidelines must be set that will aid the participants in understanding the purpose for the meeting and provide them with an understanding of what will be expected of them. This will also serve as a guide for the content of the discussion. The next part of the planning process involves addressing organizational and logistical aspects such as "sampling, meeting site, structure, procedures, and leadership" (Witkin & Altshuld, 1995, p. 155).

The exact nature of the implementation of the needs assessment group process depends upon which one has been chosen. In all cases, participants are welcomed and provided with a description of why they have been included in the group. From this point on, however, the processes begin to diverge. The nominal group technique is the most stringent. It requires everyone to take part, focuses participants on the question at hand, and ends with a consensus on the results within the group (Kaufman, 2000). Witkin and Altshuld (1995) provide a brief overview of the process which involves providing a meeting structure to be followed by the participants. Typically, participants engage in a silent brainstorming exercise and write their thoughts or ideas, both positive and negative, regarding the topic of discussion. Next, a roundtable session begins during which the meeting conductor polls the table of participants about their ideas, eliminating duplicates as the exercise continues. The meeting conductor must ensure that discussion of the ideas is to be held until the process is complete. This continues until all of the ideas have been

recorded. All ideas that are unclear should be clarified before moving to the next step of ranking the ideas in order of importance. Once the rankings have been completed, the floor is then opened to discussion.

A focus group is also conducted in a structured manner with established rules of order and is comprised of the interviewer, a recorder, and the participants. Discussion topics are generated by questioning participants and gathering their ideas. Once a list of ideas has been created, each participant is asked to identify problems that relate to the list. A summary of all the information is created and the group must agree with the content. Next, the interviewer asks a set of predetermined questions related to the topic and watches for any new information that may not have been previously addressed. The interviewer can then decide whether these new ideas present useful avenues of exploration (Rossett, 1987; Witkin & Altshuld, 1995; Zemke & Kramlinger, 1987).

Community Forums tend to be more fluid in nature and are usually held in auditoriums or large halls due to the typically large number of participants. The discussion leader presents the topic to be discussed and establishes ground rules such as time limits for speakers. The effectiveness of the person in the leadership role is crucial to the success of the event. The leader needs to keep the forum moving on schedule and not allow it to bog down while making all present comfortable in expressing their ideas. If time permits, the large group can be broken into smaller groups after the main forum to allow further discussion in greater detail (Witkin & Altshuld, 1995).

Once the group process is complete, it is important to follow up on the results of the meeting. The data must first be analyzed in relationship to the decisions that have to be made. If there are areas that are unclear or need more information, follow-up discussions should be conducted for clarification. When this is completed, results should be provided to the participants, stakeholders, and decision makers.

Rossett (1987) points out that while group processes are very useful, they are not without their problems. Those involved in each of the four roles in a group process, the planner, facilitator, recorder, and participants, must work together if the forum is to succeed. Often, the assessor, facilitator, and recorder lack sufficient authority over any of the participants, and therefore can be ineffective. Some participants may feel they have to represent a particular group or viewpoint rather than provide information as they see it. The group has to be carefully guided by the leader so that it can focus on the problems without trying to jump to solutions. Speaking in a group setting can intimidate some individuals and discourage them from presenting their own ideas or perspectives on the subject. Some participants may be extensive extraverts or introverts, leading to them either monopolize the discussion or decline to participate at all. As it is important for everyone present to contribute to the process, the leader must work to ensure participation without expressing a bias or influencing the group (Witkin & Altshuld, 1995). Finally, if the process is working at its best, it can be challenging for the recorder to keep up with the discussion in order to capture the ideas and comments being discussed.

One key to conducting a successful group forum is to listen carefully to what is being said (Witkin & Altshuld, 1995). In discussion of this aspect of group forums, it is important to keep Lundy's (1991, p. 92) nine levels of listening. They are, from least effective to most effective according to Lundy (1991):

1. Not there physically. (did not show up)
2. Being present physically, but not mentally

3. Hearing the speaker, but doing something else at the same time
4. Interrupting the speaker soon and frequently
5. Interrupting the speaker later and less often
6. Allowing the speaker to finish but, meanwhile, intensely thinking of a counterargument or response
7. Allowing speaker to finish while earnestly trying to understand what is being said, and then replying immediately
8. Allowing speaker to finish, pausing, thoughtfully considering what has been said, and then replying
9. Allowing speaker to finish and then pausing, summarizing what was heard, and only then replying

In Table 2 (below), Witkin and Altshud provide a summary of the group processes and features that differentiate one from another.

Table 2
Key Features of Group Processes (Witkin & Altshuld, 1995, p. 162)

Feature	Community Group Forum	Nominal Group Technique	Focus Group Interview
General structure	Large-group discussion format (many techniques may be used)	Small-group technique with limited interaction	Small-group interview with a limited set of questions
Purpose in Needs Assessment	Obtaining ideas regarding various aspects of needs assessment	Generation and prioritization of needs and concerns	Obtaining perceptions and views (not consensus) regarding an issue
Approximate size of group	50 or fewer	10 or fewer	8 to 12
Sampling concerns	Heterogeneous, but variations are possible	Heterogeneous, but variations are possible (don't mix super- and subordinates	Usually homogeneous in accord with the area of concern
Outcomes	Ideas, views, worksheets, votes, depending on the purpose and technique	List of ideas ad group views in order of priority	Individual and group perspectives on a focused area or theme

(table continued)

Table 2
Key Features of Group Processes

Pluses	Face-to-face discussion, multiple views, demonstrates interest in the community	Many ideas produced, priorities established and discussed, limited chance for dominance by one person	Perspectives on how an issue is viewed. Themes can be probed in depth
Minuses	Must make arrangements in advance, possible dominance by one or two persons, possible conflicts in group	Ideas are produced on the spot rather than over time, rigorous enforcement of rules, limited ability to generalize from a small group	Requires expert leadership and more than one group for reliable results

Group processes can be used at all four stages of the needs assessment process beginning with the identification of problems and their relative importance to assessing the extent of each distinct problem and setting a priority for it to be addressed (Rossett, 1987). Rossett suggests that it can also serve several other purposes, including informing participants about the status of the project, getting consensus about an issue from the public, and providing participants with the opportunity to benefit from other peoples' expertise. Rossett points out that, while group processes can be challenging, they also have the potential to generate more ideas than a single individual can, with "the whole turning out to be greater than the sum of the parts" (1987, p. 176).

Record/Documentation Review

Record and documentation review involves going through archival data that has been gathered by an organization for tracking service, demographic, or similar types of information. Data gathered from these sources is primarily quantitative in nature (Witkin & Altshuld, 1995) highlighting values that can indicate "what is" as well providing trend analysis to help in predicting future performance. The data can be categorized depending on its source into three types:

1. Existing agency or institutional records (archival sources) that are routinely maintained
2. Census or other specialized data banks
3. Evaluations of a particular program or specialized needs assessment studies focused on a particular area of concern

(Witkin & Altshuld, 1995, p. 106)

Witkin and Altshuld (1995) point out potential areas of concern involving data from agency records. Records may not be consistently kept up to date and the quality of the data may not be as high as would be expected. This can be affected by how clear and

understandable the instrument used to gather the data is or how well the instrument is understood by the operator. The thoroughness of the information, and the time in which it was gathered relative to when the service was provided are also important elements to consider. Information may be inadequate because some people might be reluctant to provide it, while others might choose not to divulge what they consider to be private information. A service provider may be reluctant to criticize a peer for many reasons including a desire not to appear judgmental or a fear that there might be negative consequences resulting from any comments made. Records too often contain limited data or no data at all on process variables that can help describe a treatment, program, or intervention and can also fall short in painting a complete picture of all related components. One example of this is standardized testing which measures some of the outcomes resultant from attending school, but certainly does not paint a complete picture of the individual student.

Witkin and Altshuld also point out that there are sometimes political barriers that must be confronted. It may be advantageous for a leader such as a politician or department head to have records that are not complete in every detail which could help insulate them from blame in any charge of wrong-doing. A final concern is that, in order for it to be as effective as possible, this type of data must be gathered in a way that will minimize interference in the work of those collecting the data.

Another specialized technique is the Social Indicators approach involving the use of data that represents important characteristics of a group or situation. Data and statistics relating to the target group is collected and compared to statistical averages gathered by state and federal agencies, census, and so on. The state of the current goals is examined and the assessor identifies those which will be analyzed and then measured against established norms. Some of the most common sources for social indicators data can be found in educational institutions, social services, and city, regional, or government units. Data can be found almost anywhere and cover a wide range of areas including test scores, absenteeism, income, level of education attainment, unemployment, age, and ethnicity to usage of government services like welfare, public heath services and transportation, as well as data gathered in previous needs assessments.

As has been demonstrated, there are numerous sources for obtaining existing data. Warheit , Bell, and Schwab (1975) suggest that the community forum can effectively be used to further assess and evaluate the social indicator data gathered. Using these various sources of hard data is cheaper and quicker than generating new information, although the data that is readily available is rarely collected and presented in a way that translates directly to a needs assessment. Therefore, links between the data and the area being assessed must be inferred (Witkin & Altshuld, 1995).

Surveys

Rossett (1987) defines a survey or questionnaire as "a written and disseminated effort to acquire information from sources" (p. 202). Surveys and questionnaires use statistical sampling of a target population to make inferences about the population (Warheit et al., 1975). This type of data gathering has the most use and also the most misuse of all the data gathering techniques (Zemke & Kramlinger, 1987). Surveys can be conducted in written form, via telephone, or by personal interview (Nickens et al., 1980).

The benefits of using written surveys are many (Rossett, 1987). A greater number of people can be reached in a more cost effective manner versus telephone or interview surveys. There is a greater sense of anonymity and respondents can formulate replies without being in the presence of an assessor resulting in greater time to consider their replies. However, they can lack in depth because, as mentioned earlier, the interview setting allows the assessor to probe more deeply into key questions or issues (See section on Key Informants) while the survey model does not. In general, surveys can also serve as visible proof that the assessor is working to ensure that diverse ideas and opinions are represented in the study. Finally, a properly designed survey can be easier to score which can speed the evaluation process and make it more efficient when presenting findings to be discussed later in group forum settings.

To be sure, surveys are not without their problems (Witkin & Altshuld, 1995). Their ease of use often lures assessors into utilizing it, even when it may not be the best method for getting at the desired data. There is some disagreement about whether or not to assess both "what is" and "what ought to be" in the same survey. Some authors advocate doing so (Kaufman, 2000) while others caution against it (Witkin & Altshuld, 1995). Another source of difficulty is the designing of a survey to discover the "wants" versus the "needs" of a group or organization (Witkin & Altshuld, 1995). A poorly constructed survey can be too general to provide the required level of specificity. Or it can also be so detailed that it becomes cumbersome and decreases the number of individuals willing to participate. Often, surveys are not subjected to rigorous scrutiny to ensure both validity and reliability, and freedom from bias. Finally, the surveys have been used so frequently through the years that they are too often discarded without even being read by many potential respondents.

Rossett (1987) suggests six steps for creating an effective survey: determine what information is needed and from whom, write effective items, write clear directions, write a good cover letter, apply a writer's checklist, and pilot the instrument. When constructing a survey, the assessor should already have determined the problem area which will help to prevent surveys that are either too long or fail to ask effective questions (Zemke & Kramlinger, 1987). In determining which questions should be asked, Zemke & Kramlinger suggest that the questions should be targeted to six question types: 1. what is needed, 2. what are the details, 3. what is the proof, 4. what are the feeling and motivations surrounding responses, 5. what is the cause(s) of the problem, and 6. what are the parameters that make up the respondent? One of the challenges in creating a survey or questionnaire is finding the balance between asking sufficient questions to ensure reliability without making the process so lengthy that people will be discouraged from responding (Kaufman, 2000).

After the questions have been carefully written, clear and concise directions should be provided which lets the respondent know what is expected. If a rating or ranking is asked for, directions should describe the scale or means of ranking. If multiple responses are allowed or if a choice other than those provided is permitted, these should be made clear.

A written survey should be accompanied by a well-written cover letter since it is the first impression the respondents have and can determine whether or not they complete the survey. An effective cover letter should state why the respondent received the survey, what the purpose is, why participation is important, how it should be returned when

completed, and what research has already been done. The letter must be sincere and express gratitude for the participants help and time. Rossett provides a writer's checklist she recommends for making a final check of the instrument (See Table 3 for a summary).

Table 3
Writer's Checklist (Rossett, 1987, pp 219-220)

The Cover	The Items (questions)
• Purpose • Direct Address • Appropriate words for audience • How selected to receive survey • Reason for responding • How and when to respond • Expression of appreciation **The Directions** **Brief** **Clear** **Appropriate to the audience** **Defining when necessary** **Provid**ing examples when necessary	• One purpose per item • Each item linked to an item type • Primarily forced choice items • Reliance upon combinational items to include open ended option • Appropriate use of highlighting, underlining, and white space • Consistency in scales and question types • Content clustering by meaningful portions of the job or task • Numbered items and pages • Words and sentences appropriate to reading level and interests • Sufficient piloting to revise and feel confident

Finally, the instrument must be tested before it is sent into the field. This can be an intimate or expanded pilot test. An "intimate test" involves having the survey reviewed by other assessors and key informants involved in the assessment while an "expanded pilot" involves sending the survey to a few individuals who are similar to the population to be surveyed. So that the survey results are as accurate and useful as possible, Rossett recommends using both types of tests before finally distributing the survey.

There are a number of authors (Burton & Merrill, 1991; Gentry, 1985; Rossett, 1987) who point to the Delphi technique as useful in conducting a needs assessment. It can help define goals, describe current conditions, and can also help to identify causes for discrepancies (Rossett, 1987). This technique involves group of individuals (typically experts or key informants) who are called upon to evaluate a group of items or questions. The responses are refined based on a comparison of all of the answers and submitted to the group again. This refinement process continues until a consensus is reached. During this time, participants are unaware of who else is participating in the process to reach agreement. This provides a means to represent dissenting views. This technique makes extensive use of surveys and can be particularly useful for proactive planning (Burton & Merrill, 1991).

Significant care should be paid to the development of the instrument to be used to ensure there is no bias in the instrument and the desired information is obtained. Observations and interviews via telephone or in person can also be considered a form of survey (see sections on Key Informant and Observation). Table 3 provides a comparison

of questionnaires, telephone surveys, and personal interviews illustrating the various positive and negative aspects of each.

Table 4
Evaluation of Three Methods of Survey Research (Nickens et al., 1980, p.57)

Criteria	**Mail Questionnaire**	**Telephone Survey**	**Personal Interview**
Cost	Low Cost. Little relation to sample size.	Moderate cost directly related to sample size and geographic dispersion.	Moderate cost directly related to sample size and geographic dispersion and personnel required.
Response Rate	Low response rate. Follow-up techniques costly but useful.	High response rate.	High response rate.
Length of Time	Moderate time period (few weeks at least). Not affected by sample size.	Short time period. Directly related to sample size, length of interview, and number of personnel available.	Long time period. Directly related to sample size, length of interview, geographic dispersion, and number of personnel available.
Personnel Required	Few personnel required. Mostly clerical help.	Moderate personnel required. Related to sample size and length of time; Some training beneficial.	Extensive personnel required. Directly related to sample size and length of time; extensive training beneficial.
Quality of Data	Moderate accuracy. Possible misinterpretation, good with sensitive issues, possible response bias	Moderate accuracy. Moderately sensitive issues, short answers, more condensed.	Moderate accuracy. Interviewer bias, reduce misinterpretation, greater elaboration on answers.

Observation

      There are a number of positive aspects of using observation as a form of data gathering (Rossett, 1987). It provides flexibility to the observer because, while entering an environment to observe a particular behavior or activity, it may be possible to discover other factors that may be affecting outcomes. This type of first-hand observation can provide information beyond that which was collected in other data gathering efforts. It is not unusual to find that what a person says about a given situation and what actually happens are not exactly the same. These discrepancies or differences found in observations can lead to more detailed observation or indicate a need to use other techniques to investigate and to probe more deeply. Observations often have both

quantitative and qualitative facets to the data that they can provide which is exhibited in terms of actions that are counted versus observed external factors acting upon the task or behavior being documented.

While these benefits can make a compelling argument for the use of observations as a form of data collection, there are also some other important issues for the assessor to consider (Rossett, 1987). First, the presence of an observer can affect the setting and way people conduct themselves. When they know they are being watched, they may be more conscious of their actions and behaviors, affecting their actions or performance. Observers must also be aware of what they are observing, why they are observing, and their own feelings about it. They must take care that their observations are not clouded or framed by any external information or preconceived ideas in order to minimize any bias that might be introduced into their observations. The observer must also be aware that tedium can accompany counting actions while distractions or boredom can cause the observer to miss some of the activity that should be recorded.

Rossett suggests effective observers should have the following characteristics:
- A curious nature
- Patience in gathering the data
- Tact in explaining their presence so as to assuage any concern those being observed might have
- A willingness to blend in so as to not interfere with the environment's normal operation
- An understanding of what is being observed
- The ability to observe and record at the same time
- The ability to follow the observation guide, while also being aware of factors outside the normal
- The ability to look at what is being observed at both a macro and micro level
- The ability to interpret what is being observed and assign meaning.

Rossett points to military training professionals who, as a group, make good use of this technique as a method for gathering data related to their training programs. Despite its value and flexibility, Rossett suggests that the use of observations is in decline and now tends to be underutilized by many organizations, possibly due to a shift in focus from skills training for tasks like maintenance, equipment installation, to problem solving, management proficiencies, and other types of activities that occur at a higher level in the organization or system.

Distance Learning Technologies

As has been shown in the literature, successful needs assessments employ multiple data gathering techniques and involve the stakeholders in the assessment process. Often, data gathering activities such as group forums or key informant interviews can involve persons who are separated by geographic distances or whose schedules limit their ability to participate in traditional group activities. These represent some of the same types of problems that educators have sought to overcome in delivering instruction to students outside the traditional classroom setting. Numerous technologies have been used to bridge this distance. Some of these have been used "as-is" while others have been combined to create a more effective learning experience. Extensive research

regarding use of these technologies in the distance learning arena serves as a useful base for exploring the use of such technologies in a needs assessment setting.

Numerous communication and collaboration technologies have been used in this field and continue to evolve in terms of functionality and usability. Improvements to the telecommunications industry and the resultant decreasing costs have further improved the distance learning experience and possible interactions. However, it is important to have a clear understanding of what distance learning is before determining which technologies might best apply and how. This includes knowledge of the types of interactions that are possible among currently available communication mediums and the issues related to each of these.

Distance Learning Defined

Just what is distance learning? A quick search of reference.com ("The american heritage® dictionary of the english language", 2000) defines distance learning as:

> Education in which students take academic courses by accessing information and communicating with the instructor asynchronously over a computer network. Also called distance education.

While on the surface, this definition seems to be in line with what one might expect, it is actually too constricting. It states that communication is asynchronous between the instructor and learner and while this may still predominantly be the case, new technologies are allowing communication and interaction in real time between the instructor and learner (McIsaac & Gunawardena, 1996). The definition also suggests that communication and interaction exclusively involves computer networks and ignores several delivery mechanisms such as correspondence course, CD-ROM interactive learning, telephones, that do not necessarily involve a computer network. It is important to recognize that the technical media that distance education relies upon is continually evolving and, given the dependence of distance education on technologies, it might be more accurate to define distance education in general terms and then give examples of its use. Dr. Michael Moore, editor of The American Journal of Distance Education, offers such a definition (M. G. Moore, 2003):

> "Distance education describes teaching-learning relationships where the actors are geographically separated and communication between them is through technical media such as audio and video teleconferences, audio and video recordings, personal computer, correspondence texts, and multimedia systems."

This definition provides a better and more inclusive representation of distance learning without being limited to specific types of technologies or communication methods. Using a general understanding of distance learning, it is then possible to examine some of the various types of communication methods and technologies that facilitate the teaching-learning process.

Distance Learning Technologies

The number of technical media options available for use in a distance learning environment is quite large and continues to grow. In order to make the best decision about which to use, it is advisable to examine the context in which the technology is to be applied rather than just the technology itself. To provide a framework for this context, consider the 4-square map of groupware options (Jonassen *et al.*, 1991) shown in Figure 2.

- Voice Mail
- Computer conferencing

DIFFERENT TIME

DIFFERENT PLACE

SAME TIME

DIFFERENT PLACE

DIFFERENT TIME

SAME PLACE

SAME TIME

SAME PLACE

- Two-way video
- Screen sharing

- Stations for shift work
- Team rooms

- Workstation networks
- PC projectors
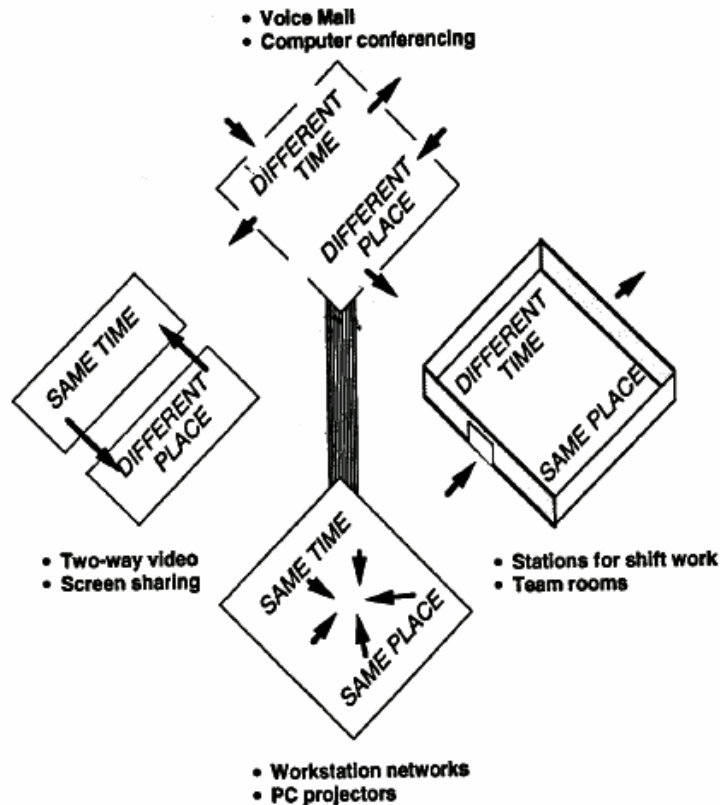
Figure 2: 4-Square map of groupware options (Jonassen et al., 1991, p. 16)

This map provides a representation of the types of communication that occurs between participants in a distance learning program: same time/same place, same time/different place, different time/same place, and different time/different place. The technology used in a particular setting is dependent on the type of communication it is intended to facilitate. McIsaac and Gunawardena (1996) used this as a basis for determining appropriate technologies for any given type of communication. Same time/same place represents the traditional face-to-face meeting and, while this type of communication is not distance learning, it may be incorporated as part of a distance learning program. The British Open University offers some distance courses that include labs requiring detailed, face-to-face interactions between the instructor and learner. An example could be a demonstration of a medical surgical procedure. While technology may still be used in this setting, it typically consists of computer and projector, overheads, flip charts, and so on. In a different time/same place setting, learners are given designated places to go at specific times to meet with other students, tutors, or instructors. This, too, is not typical distance learning, but as with the same time/same place example, it can be used as a part of a distance learning course to provide learners with additional information or learning opportunities beyond those supplied through technology-based means or mediums. This option employs the same kinds of technology found in a same time/same place setting.

Distance learning interactions become much more apparent in different time/different place interaction. This represents the oldest type of distance learning

communication, seen almost a century before many of the technologies used in training today. For example, the University of Chicago began offering the first major correspondence program in the late 1800s (McIsaac & Gunawardena, 1996). In addition to printed materials, McIsaac and Gunawardena list audiocassettes, videocassettes, computer-assisted instruction/computer based training, interactive video, and computer-mediated communication (e-mail, news groups, and so on) as types of technologies used in this setting. Finally, there is the same time/different place form of interaction. McIsaac & Gunawardena (1996) point to audio teleconferencing, full-motion video teleconferencing, compressed video teleconferencing, desktop video conferencing, interactive instructional television, and broadcast/cable television and radio as useful technologies in this setting. Each of these settings could be representative of possible interactive scenarios that could be useful in needs assessment.

Technologies Suitable for Needs Assessment

Witkin and Altshuld (1995) suggest that "the use of interactive electronic techniques to conduct meetings is widely accepted" (p 203). But which technologies are best suited for what type of needs assessment communication? To make this determination, the first step would be to match needs assessment data gathering techniques with the best corresponding types of communication.

Consider the survey. It is a written method for gathering information from a sample of a population in order to make inferences about the population as a whole. This data gathering can be conducted using three types of communication: by mail, online, or by telephone. The traditional survey format sent through the postal mail service would represent different time/different place. Numerous trade magazines offer a free subscription to qualifying individuals in exchange for answers to a survey. These surveys can now be completed online using a web browser. One could just as easily gather data in a same time/same place setting. An example might be a standardized course evaluation form or standards of learning tests. The telephone survey has already been in use for a long time as a method for gathering data in a same time/different place setting. Different time/same place interactions, while possible, would not make much sense for a survey.

Observations can make use of the same types of interactions. The original method of observation would fit the same time/same place form of interaction in which the assessor finds a way to directly observe the individual, group, or process being assessed without affecting performance. When calling a business, a recorded voice often announces "this call may be monitored for quality assurance". This could be an example of same time/different place (assessor listens in on conversation) or different time/different place (recorded for later review) interactions. With the advent of closed circuit TV and various forms of video recording technology, visual observations can be conducted without intruding into the workplace. Observers can watch either live or pre-recorded video of an individual or group. However, if the camera is placed in the workplace and those being observed are aware of it, this has the potential to adversely affect the results by making the subjects self-conscious or attempt to change the results (Witkin & Altshuld, 1995).

Review of records and documentation does not directly represent a form of communication between the assessor and individuals or groups being assessed. Nevertheless, there are still technologies worth mentioning that can provide information

for the assessor. This can be in the form of records that are simply stored electronically to log files on machines designed to keep track of basic information such as traffic on a computer network's infrastructure or a system's usage patterns. Depending on the way in which it is stored, electronic data can make it easier to gather and compile information for a needs assessment. Log files could also provide useful insights in many areas. These could include such things as identifying the origin and number of hacker attacks, indicating a need for stronger security measures, or finding bottlenecks that could slow productivity or create lag times in a student's ability to access digital content for a learning exercise. The fact that record review is usually historical in nature rules out communication that could be occurring at the same time. In fact, the review of these documents could constitute a form of communication between the needs assessor and the subjects through the data itself (one of the "different time" interactions). However, this argument would be better left to other fields of discipline.

As illustrated in the previous section *Traditional and Contemporary Tools for Gathering Needs Assessment Data*, both key informant and group processes require a high level of communication. Given the nature of critical information gathered during these types of processes, communication at different times would be less than ideal. Looking at the key informant, it is conceivable that different time/different place interactions during which e-mail, postal mail, or other types of time-delayed communication could be used to conduct an interview. While it is possible, this method for conducting an interview would be impractical and an attempt to perform this type of communication with a group process would be out of the question.

A different time/same place interaction could be created by asking the key informants to report to a specific location at a specific time. This would be more practical in some settings than others. An assessment of factory workers on an assembly line or employees in a retail store would benefit, as neither group typically has offices of their own. It is often the case that it is better to visit the key informants in their own environment as a matter of courtesy and convenience in exchange for participation in the assessment process. These same types of issues are also present for different time/same place interactions with group processes. Furthermore, care should be taken when choosing the composition of groups to be brought in so as to minimize concerns participants might have about why they were assigned to a particular group.

Now that different time interactions for key informant and group processes have been examined, it is important to consider situations where communication is occurring at the same time. Same time/same place interactions, while still involving the traditional face-to-face communication, can make use of distance technologies as a means for recording interaction information. Video recording devices have been used to document interviews with key informants and group activities. This type of technology allows the interviewer to review the session later, thus ensuring that critical information was not missed. Technology can also effectively be used to gather input anonymously. For example, a focus group could be shown a number of visuals or concepts with all participants given devices for recording their opinions. Responses could then be displayed on a screen showing the results. The level of anonymity would encourage participants to more freely share their thoughts on controversial subjects without fear of public reprisal or criticism from the other participants.

Same time/different place interactions have been in use for a long time in the form of telephone interviews used, to gather needs assessment data from key informants. While less than ideal due to the potential volumes of typing, online chat programs could also be an effective means of gathering data from individuals or groups when other means of technology are not available. Some of the more recent technological advances like improved network bandwidth, decreasing technology costs, and improved computer speeds have had their greatest impact on same time/different place communication in groups. These technology advancements have increased the quality of synchronous communication and decreased its cost. Groupware collaboration software can allow individuals or groups to interact synchronously with video and/or sound as well as exchange textual information. IBM, for example, has numerous labs throughout the United States equipped with a software package called TeamFocus which is used internally and also rented to other businesses (D. Kirkpatrick, 1992). Many two and four year higher education institutions now have similar types of labs for conducting training at a distance. The program Microsoft NetMeeting is just one of many such software programs now in use. When this kind of technology is applied to a needs assessment group process, participants are able to interact with one another while providing the assessor with a means to build the list of needs as the discussion progresses. Another important advantage is that participants from multiple locations are able to react simultaneously to the same information. A summary of these findings are represented in Table 5.

Table 5

Data gathering methods/Interaction types comparison

Needs Assessment Data Gathering Methods	Different Time/Different Place	Different Time/Same Place	Same Time/Different Place	Same Time/Same Place
	Interaction Types			
Surveys	•	?	•	•
Observations	•	?	•	•
Record/Documentation Review	?	?		
Key Informant		•	•	•
Group Processes		•	•	•

? = Interaction is questionable

Relevant Empirical Research

As internet and computer-based technologies grow, the gap in available access to these technologies continues to decrease. Nevertheless, it is important to consider the technical abilities of those being assessed when considering the use of distance technologies as part of needs assessment data gathering process. This factor can either broaden or limit the number of technologies available for consideration. Research on the Digital Divide provides insights into the demographics of computer users. According to a report compiled by the U.S. Department of Commerce ("A nation online: How Americans are expanding their use of the internet", 2002) "Children and teenagers use

computers and the Internet more than any other age group" (p. 1) and cites the following 2001 statistics:

- Ninety percent of children between the ages of 5 and 17 (or 48 million) now use computers.
- Seventy-five percent of 14-17 year olds and 65 percent of 10-13 year olds use the Internet.
- Family households with children under the age of 18 are more likely to access the Internet (62 percent) than family households with no children (53 percent), and non-family households (35 percent).
- Computers at schools substantially narrow the gap in computer usage rates for children from high and low-income families.

This should be good news for anyone gathering assessment data from elementary, middle, high school, or college students if the study requires participants to interact with computer-based technology. However, things might not be as easy for a locality in the process of developing a comprehensive plan for community growth. In this process, the age range will be much wider and, while interacting with different technologies may not be a problem for the young, this is not necessarily the case for the rest of the population. The Department of Commerce reports that "individuals 50 years of age and older are among the least likely to be Internet users. The Internet use rate for this group was only 29.6% in 2000. However, individuals in this age group were almost three times as likely to be Internet users if they were in the labor force than if they were not" ("Falling through the net: Toward digital inclusion", 2000). In the United Kingdom, "only one in 25 people over age 64 uses the Internet, the firm reported, while that demographic accounts for about 20 percent of the overall population" (Hillebrand, 2000). This would indicate that there will probably be problems when gathering data from older participants without experience with computer technology. When attempting to collect data using an online survey, a further consideration is that the results may be skewed away from certain groups who are less likely to feel comfortable using the internet.

This problem is not limited to older generations. The number of people who are capable of using computers is still quite far away from 100 percent. As a result, there are a number of people in other age groups who have difficulty interacting with or having access to computer technology. Another significant finding indicated persons with disabilities and handicaps were less likely to use computers and the internet ("A nation online: How Americans are expanding their use of the internet", 2002). These factors can affect which technologies are best suited to gathering data. These can also be a factor relative to the assessor's knowledge and familiarity with given technologies.

Summary of Literature Review

This review examined several issues related to needs assessment and distance learning resulting in a case for using the two processes together. It began with a detailed review of the needs assessment process, clearly defining a need as the difference between what is and what should be. It went on to stress the importance of the difference between a "need" and a "want" and the expression of each need in a manner that does not immediately suggest a solution. Needs assessment was defined as the identification of needs (sometimes referred to as gaps) which are then ranked in importance. When conducting a needs assessment, it is important to identify the ends, not the means.

Involvement of stakeholders is a key factor to the success of a needs assessment. However, participants should participate because they wish to offer their own opinions rather than present a particular point of view and should be included because they have something to contribute and not just to give them a sense of belonging.

Often, there is confusion between needs assessment and needs analysis, which takes the process a step further by identifying solutions. A detailed review of several varying models found that many were designed for specific situations with only a few offering a generic format that could be easily molded to multiple situations. Furthermore, no empirical research could be found to indicate that any one model is significantly better than the others.

The focus of the needs assessment literature review then shifted to the methods of gathering data in a needs assessment process. These consisted of key informants, group processes, record/documentation review, surveys, and observation. Of these, the two most frequently used methods of gathering data were the survey and group processes.

The final part of the review looked at distance learning technologies and the types of communication that occur when technologies are employed to help facilitate communication. Four interaction types were identified. They are same time/same place, same time/different place, different time/same place, and different time/different place. Lines were then drawn between these communication types and the needs assessment data gathering techniques. Empirical research was presented which identified potential usability issues to be considered when employing distance learning technologies. These included the varying technical abilities of those interacting with technology due to age or accessibility.

Rationale for Study

The literature identified that some of the most common needs assessment data gathering techniques involved group processes. There was only one piece of literature found by the researcher that addressed the concept of using electronic means of communication to facilitate meetings and saw no reason why it could not be used for needs assessment data gathering (Witkin & Altshuld, 1995). Unfortunately, this piece was mostly anecdotal. This review of literature has sought to provide detailed analysis thereby building a more substantial case for the use of technologies in this setting. However, because it is possible to do something, it does not necessarily follow that it should be done. The body of literature does not appear to address whether or not the use of these electronic communication techniques in group processes have an affect on the willingness of participants to communicate and contribute to the process. As has been stated earlier, participation by all members in a group process is vital to the success of the group process. This study therefore observed small group assessments in this setting and described the process as it unfolded.

CHAPTER TWO
Methodology

Statement of Purpose

In Chapter 1, this document identified the key aspects of conducting a successful needs assessment. In looking at data gathering methods, it was concluded that after surveys, group processes were the most frequently used methods for gathering data with the Nominal Group Technique being the most popular of all the group processes. It then proceeded to look at the concepts of distance learning interactions and various means of communication. The literature builds the case for the importance of participation in group processes and lays the groundwork for using technology to facilitate these processes. However, there does not appear to be discussion on the ways in which using distance learning technologies in a focus group can impact an individual's participation or perceptions and how this impacts the group process and its success. This study sought to provide additional information in this area by conducting a focus group via distance technologies for a needs assessment process and describing various aspects of that process as it progressed.

A traditional focus group involves verbal, non-verbal, and written forms of communication. This study created an environment that would provide opportunities for both verbal and written communication using technology. However, because they lacked proximity to other participants during the process and were not able to read facial expressions, use body language, or give or receive any other non-verbal cues, the non-verbal form of communication was absent. The study was interested in identifying differences or abnormalities in the process that departed from what was expected and in gauging the participants' feelings about the overall process. These observations were guided by the desire to find the answer to the following research question:

What is the nature of an individual's focus group participation when technology is used to facilitate communication among the group?

Design and Procedures

A descriptive research method was used to seek answers to the guiding research question. The descriptive research method combines results from both quantitative and qualitative methodologies. A combination of results from an existing instrument in the field of communication anxiety and survey data was used to describe the setting. Literature suggests that this type of data gathering can be effective in describing a situation (Gall *et al.*, 1996).

Selection of Participants

The study required conducting a needs assessment group process in order to adequately answer the research question. The assessment needed to include a group comprised of typical professionals from a given field that are geographically dispersed and who could be considered stake holders in the topic area being assessed. Numerous people and professions could have fulfilled this requirement. Economic development professionals provided an interesting and diverse group on which to base such a study of

new needs assessment data gathering techniques since those working in this area have a wide range of technology skill levels.

Economic development can be loosely defined as finding the best and most creative ways to use and promote a region's resources to achieve economic goals ("What is economic development?" 2003) and it has been suggested that "the entire set of approaches to economic development practice may be considered as a specialized form of marketing." (c.f. Swager, 1991, p. 4). Appendix B offers a more detailed discussion about what economic development is and how to identify organizations that engage in that type of work.

As part of the restructuring efforts in 2002-2003 within Virginia Polytechnic Institute and State University, the Office of Economic Development (OED) was formed. This office was tasked with providing economic development assistance to constituents with a particular focus on economic developers in central and southwestern Virginia. The leadership of this group felt they would benefit from a needs assessment involving economic development professionals from these regions. The OED was already planning a series of focus group sessions as a part of their needs assessment and agreed to allow this study to be a part of that process. Participants consisted of members of the economic development community who were key informants identified by the OED within the specified geographic area. In order to perform the study, the researcher obtained IRB exemption approval from Virginia Tech's Institutional Review Board for projects involving human subjects.

Communication Apprehension and the Communication Anxiety Inventory

Communication Apprehension (CA) looks at various aspects individual's apprehension in communicating with others in different settings. Within this field are instruments that measure individuals' anxiety levels. Anxiety is defined as:

> A state of apprehension, uncertainty, and fear resulting from the anticipation of a realistic or fantasized threatening event or situation, often impairing physical and psychological functioning. ("The american heritage® dictionary of the english language", 2000)

CA occurs when anxiety is felt by an individual as a result of being in a situation where communication with one or more individuals is required (Booth-Butterfield & Gould, 1986, Spring; McCroskey, 1982; Rubin *et al.*, 1994). CA can be examined either as a trait or state variable. The trait anxiety variable (trait-CA) can indicate an individual's overall communication anxiety level or may indicate anxiety within certain contexts (context-CA) or with specific individuals. Conversely, the state anxiety variable (state-CA) typically indicates anxiety at a particular point in time (Booth-Butterfield & Gould, 1986, Spring; McCroskey, 1982; Rubin et al., 1994).

Booth-Butterfield and Gould (1986) offer a good example of the differences between trait-CA and context-CA. They explain that "A high trait-CA person is assumed to fear most communication situations, while a high context-CA person is likely to fear only specific contexts, such as speaking or interpersonal settings." (Booth-Butterfield & Gould, 1986, Spring, p. 194) state-CA represents a persons anxiety at a point in time (Booth-Butterfield & Gould, 1986, Spring). Prior to the acceptance of the concept of context-CA, the tools and research focused on "broadly based anxiety related to oral communication" (McCroskey, 1970, p. 270).

Booth-Butterfield and Gould (1986) point out that within the CA body of literature, there is some confusion between state-CA and CA. Compare McCroskey's definition of CA as "…level of fear or anxiety associated with either real or anticipated communication with another persons" (1984, p. 13) with Spielberger's definition of state anxiety which is "consciously perceived feelings of apprehension and tension, accompanied by or associated with activation or arousal of the autonomic nervous system" (1966, p. 17). These experts feel there is little difference between the two definitions and that they are really one and the same. While they determined that this notion was not new to the literature (McCroskey & Beatty, 1984; Richmond, 1978), they found little empirical evidence in the literature that actually attempted to measure the relationship between context-CA and state CA. Building on these concepts of context-CA along with supporting empirical instruments that began to emerge in the early eighties (McCroskey, 1981, April; McCroskey, 1984) , Booth-Butterfield and Gould developed the Communication Anxiety Inventory (CAI) to demonstrate empirically the relationship between context-CA and state-CA. The CAI consists of two instruments, Form Trait and Form State.

Form Trait has 21 self-reported items and measures the individual's trait-CA as well as three context-CAs which are dyadic, small group, and public speaking. It uses a four point Likert scale with responses from "almost never" to "almost always". Scoring instructions are included with each of the forms in Appendices C and D. The authors of Form Trait point out similarities between their instrument and the Personal Report of Communication Apprehension developed by McCroskey (1982), suggesting that they may be parallel forms (Booth-Butterfield & Gould, 1986, Spring).

Form State is designed as a tool to assess an individual's anxiety in any context at a given point in time and employs a four point Likert scale with responses from "Not at All" to "Very Much So". Scoring instructions for this instrument are included in Appendix C. The authors of Form State based it upon an earlier model developed by Lamb (Lamb, 1972). They compared it favorably to the x-1 state measure (C. D. Spielberger *et al.*, 1970) and presented research showing that it provided as good a measure as x-1 (Booth-Butterfield & Gould, 1986, Spring).

Reliability

The CAI Form Trait appears to be internally consistent with an alpha coefficient for all 21 questions of .90 and a split-half estimate of .92. When alpha coefficients were calculated for context scores, values of.65 (dyadic), 85 (small group), and .89 (public speaking) were attained with split-half estimates of .67 (dyadic), .86 (small group), and .89 (public speaking) (Booth-Butterfield & Gould, 1986).

The CAI Form State also appears to be internally consistent. An alpha coefficient of .91 and a split-half reliability estimate of .92 was reported in the initial development study (Booth-Butterfield & Gould, 1986, Spring). In later research, similar reliability estimates were reported (Ayres, 1988, 1990; Booth-Butterfield, 1987, Spring).

Form Trait and Form State Validity

The CAI Form Trait exhibits considerable construct validity. "Factor analysis (principle factors, multiple squared correlations in the diagonal, oblique rotation, and eigen values greater than one) consistently yielded a four factor solution: the three contexts and a physiological factor" (Booth-Butterfield & Gould, 1986). In addition, a

strong correlation was found between context scores and their related state anxiety scores with Pearson correlations of .357 (Dyadic), .574 (Small group), and .711 (Public speaking) with statistical significance beyond the .05 level.

The communication apprehension literature has provided confirmation of the CAI Form State's construct validity (Rubin et al., 1994). In a psychophysiological study, Form State scores were found to be a sign of stress induced by public speaking (Booth-Butterfield, 1987, Spring). When compared with the x-1 state anxiety measure (C. D. Spielberger et al., 1970), Form State was found to correlate significantly (r = .69).

Instrumentation

The data for this study involved the use of surveys to gather information about participants. Two of the surveys were the Form-Trait (Appendix C) and Form-State (Appendix E) which are part of the Communication Anxiety Inventory (CAI) developed by Booth-Buterfield and Gould (1986, Spring) to measure trait and state communication apprehension. Appendix E contains another survey used, this one an evaluation survey designed to gauge participants' impressions of the process' success, strengths and weaknesses, and aspects of their participation including their ease in interacting with the technology for the focus group. D. L. Kirkpatrick points out that "the most common reason for evaluation is to determine the effectiveness of a program and ways in which it can be improved" (1998, p. 16) and the questions in the survey sought to do exactly that - -evaluate the process' effectiveness and identify ways to improve on it.

The Process Described

An invitation was sent to request participation in the focus group study that included a description of the topic to be assessed. It was determined that to not allow participants to have prior knowledge of the topic might have introduced delays in their responses that could have been misinterpreted as delays caused by the environment, since participants might have wanted or needed additional time to contemplate and formulate their response if they had not been given prior knowledge.

Upon completing the participation consent form online, subjects were directed to another web page with the Form Trait instrument (Appendix C). Once all the participants were identified, dates were set for the focus groups to meet and each participant was assigned into one of three groups.

A number of technologies were considered for facilitating the process involved in 2-way audio and the medium for recording and manipulating data. Microsoft Live Meeting had the capability in Voice Over IP (VOIP) as well as an interface that could facilitate a type of white board for participants to view. It was decided that the phone would be used because of its ready availability among the target population compared with the microphone and computer configuration necessary to facilitate the audio communication. The better fidelity and reliability provided by the telephone were also factors. All audio was recorded so as to aid in the data collection process.

When the scheduled time for a given focus group arrived, participants would sign on to Live Meeting and then call an 800 number that would conference them in to the group. The recorder served in traditional capacity, recording participants' ideas in Live Meeting during the first part of process, performing the necessary manipulations as a group eliminated duplicates, and then prioritized the ideas that were generated based on participants' votes. A facilitator would be present to help guide the process while the

recorder would capture participants ideas and aid the facilitator as needed. During a later review of the recorded audio, any problems encountered by participants as well as any other events of interest were noted.

The facilitator welcomed everyone and then stated the goals of the focus group and the rules of engagement. During the beginning of the process, the types of reactions and questions the participants provided were noted to determine if the types of questions or comments that arose were simply questions about the assessment process or if they could have arisen due to the technology being used to facilitate the process.

The facilitator then began to solicit ideas from the group by calling on each participant in turn and asking for a single idea on the topic. During this process, ideas were only listed, not discussed. If a participant had no more ideas, they "passed" and this continued until everyone had expressed all of their ideas. The recorder noted the ideas presented in Live Meeting so they could be viewed by all participants. Once all the ideas were recorded, the facilitator asked participants to review the list on their screens to determine if each item represented a distinct idea or if there were ones that really represented the same concept. The recorder updated the list based on the feedback provided by the group resulting in the removal of duplications and combining of similar ideas. Once the group agreed on the new list, they began the process of prioritizing the remaining items, which was accomplished by weighted vote. Each participant had five votes which had different numerical values. Their first vote counted as 5 points and was cast for the item which had the most importance to them, their next vote counted as 4 points, and so on. Again, the recorder made updates to the list as directed by the group.

When the list had been prioritized, the facilitator brought the focus group portion of the process to a close. They then instructed the recorder to have Live Meeting display a web page containing a survey and instructed the participants to complete it to help with the evaluation of the process. The survey included the Form State (Appendix D) measure as well as a set of questions (Appendix E) which recorded the participants' experiences during and impressions of the process.

Data Collection

Individuals who agreed to participate in the needs assessment focus group were instructed to go to a World Wide Web address which directed them to survey.vt.edu, answer the questions using the form on the web page, and then click submit. The form consisted of a blank for the participant's e-mail address and the Form Trait pretest (Appendix C). Survey.vt.edu saved all participants' answers upon their clicking the submit button.

An audio recording was made of the entire focus group process for later review in order to note unusual or unexpected behavior. This could include such events as delays in users' response during the round-robin and possible causes, any questions or problems expressed by participants as a result of the information being presented via Live Meeting as the recorder updated information, or any other items related to the process of note. Upon completion of the focus group process, participants were presented with the Form State (Appendix D) and a survey to record their experiences and impressions of the process (Appendix E). This survey also included a blank for their e-mail address so results could be linked with their first survey.

Data Analysis Procedures

In developing the Communication Anxiety Inventory, Booth-Butterfield and Gould set out to demonstrate that individuals' state anxiety could be predicted by their trait anxiety scores (Booth-Butterfield & Gould, 1986, Spring). To that end, they developed the Form Trait and Form State instruments and established a scoring system for each. As mentioned earlier, Form Trait provided scores for three types of communication anxiety: Dyadic, small group, and public speaking.

In using the instruments for this study, a trait anxiety score was determined for each participant. They were then subjected to a communication setting and a state anxiety score was taken immediately following. The state score and the appropriate trait score were then standardized and descriptive statistics were used to analyze the data. The initial study where in the Communication Anxiety Inventory was presented used regression and correlation analysis and demonstrated the relationship between state and context scores.

Based on the research by Booth-Butterfield and Gould (1986, Spring), individuals' z-scores on their trait test should be reasonable predictor of their state scores. This study used the online survey to gather raw scores for Form Trait and Form State using survey.vt.edu and exported it into a standard data file. This file was then used to perform statistical analysis. Participant scores were converted to z-statistics so that they could be compared. Basic descriptive statistics were used to further evaluate the results and the data was analyzed for possible trends that might explain the disparity.

The observations made during the review of the audio recordings of the process (such as excessive response delay, questions that might indicate difficulties interacting in the environment, technical problems, and so on) summarized in Critical Incidents section of Chapter 3, and responses to survey questions that recorded participants experiences and impressions(Table 7) were reviewed to determine if there were any trends that could have been the result of the participants being isolated or of any other types of interactions that might have been caused by the Live Meeting communication tool. Possible themes relating to participants' trait and/or state anxiety as well as coming from their survey results were also examined. Finally, information on the groups' members' impressions of the overall success of the process and ways it might be improved was gathered and evaluated.

Description of Process as it Unfolded

The Office of Economic Development (OED) at Virginia Tech identified a number of potential participants for whom they wanted to conduct an assessment and sent them an invitation to participate (Appendix F). After a slow initial response, OED sent a follow-up invitation (Appendix G). Once a minimum of six individuals accepted the invitation, OED sent a note thanking them for agreeing to participate and notifying them that they would be contacted by the researcher with more information about the study, and to set up dates for the assessment (Appendix H). Witkin and Altshuld (1995) identified six to ten people as being the ideal for this Nominal Group Technique. The researcher then followed up with a note (Appendix I) stating the purpose of the study, providing a link to a web based survey that included a consent form and the Form Trait instrument, and also provided an opportunity to identify times for the group to meet via conference call.

A total of seventeen participants who were willing to be a part of the study read and accepted the consent form and completed the Form Trait instrument (Appendix C).

They were assigned numbers based on the order in which they completed the Form Trait instrument and will be referred throughout the rest of the study as P01 through P17.

All groups were conducted in a consistent manner. Prior to a group's scheduled needs assessment, participants were sent an e-mail (Appendix K). This e-mail:

1. Reminded them of the time for the needs assessment
2. Notified them that they would be contacted by the researcher to ensure that their computer could connect to a test meeting created in the Live Meeting system via a provided URL
3. Provided the phone number and pass code for the conference call
4. Provided a URL for them to connect to the actual meeting for the needs assessment.

The conference calls were facilitated using a conference call service provided to Virginia state and local government agencies by the Virginia Information Technologies Agency.

A few days before each assessment, participants were contacted by the researcher via phone and asked to connect to the test URL to ensure that their computer equipment was capable of participating. All participants were running Windows XP. While most participants used Internet Explorer as their default browser, two were using Mozilla Firefox. As a result, Live Meeting provided a version of the interface which was not as robust and reliable. Therefore, they agreed to use Internet Explorer during the assessment. Two participants were running Windows XP with Service Pack 2 installed and were also not set up as local administrators on their computers. Service Pack 2 contains substantial security improvements which restrict programs from making potentially harmful changes to the system. Only users with administrative rights can install software and modify settings. These restrictive security settings presented problems for their participation. Both contacted their IT support personnel who were able to resolve Windows XP security problems for them. However, P16 was also faced with network security settings outside of Windows XP requiring that the refresh button be used repeatedly to see updates to the virtual white board.

Each group session began with an introduction by the moderator. The agenda and rules of the process were stated and displayed on the screen. Participants were then introduced after which the facilitator began to solicit ideas from the participant in a round robin fashion. Once all ideas were gathered, a copy of their input was made onto another slide and discussion began to eliminate duplicates. Next, a copy of this process was made on a new slide and discussion began in order to clarify and refine the remaining ideas. A vote was taken to determine the final priorities. Each participant had four weighted votes and could place no more than one vote on any need. Participants were polled for their votes and a final tally sheet was presented, ranking the needs in the priority as determined by the group. Appendix L shows the introductory slides as well as the results of each groups' assessment process. The recorder then displayed a copy of the Form State instrument and evaluation survey and the moderator instructed the participants to complete this survey before bringing the process to a close.

CHAPTER THREE

Results

   With the exception of the addition of one group, the study was conducted in accordance with the methodology outlined in Chapter Two. The original plan called for a two groups of six to ten participants per group. A third group was added to increase the number of participants in the study thereby allowing the Office of Economic Development to conduct assessments relative to Blacksburg, VA in far SW Virginia (Group 1, 5 participants), near SW Virginia (Group 2, 6 participants), and one group that spanned all of SW Virginia (Group 3, 6 participants).

Critical Incident Observations

   In reviewing the audio recording made of each session, the following incidents that could be attributed to using distance learning technologies for needs assessment were observed. They are sorted by order of occurrence and are clustered by the group in which they occurred.

Group 1

1. A participant received security warnings when connecting because Windows XP Service Pack 2 was being used.
2. P01 experienced a slow hookup when joining the meeting screen and also clicked on the test URL instead of the assessment meeting. Despite agreeing to use Internet Explorer for the session, Firefox was used initially which caused additional problems connecting. P01 seemed to exhibit difficulty in the use of web browsers.
3. P08 had trouble getting connected and instead of using the URL provided to log on, P08 went directly to the Live Meeting web site. As a result, a login prompt appeared, while the provided URL would have automatically logged them on. Two attempts were made to log on this way but typographical errors prevented access to the system. Finally, P08 closed the browser and re-reconnected using the URL provided to all participants via e-mail (Appendix K) which resulted in a "this page displays both secure and non-secure items" warning because of the Windows XP Service Pack 2 but otherwise had no problems.
4. P05's meeting ID and password came up blank and it was not clear if it was because the site had been accessed in the same manner as P08. After being instructed what to put in the blanks to login they were able to access the site without any problems.
5. P04: Initially went to the test site.
6. P01 thought the ideas were to be entered onto the screen.
7. P07 observed that the system was not showing all persons' names in the list of attendees
8. During the data recording process, the recorder would occasionally hit a key that would jump ahead and back a slide

9. Two people reported that their screens stop updating. P08 used the refresh button to fix the problem while the other participant had to close their browser and re-enter the meeting.
10. P08 used the refresh button because the screen did not update again.
11. P08 finally lost the connection completely, close the browser and re-entered the meeting.
12. The recorder initially copied and pasted the wrong column of final results to the screen.

Group 2
1. P11 joined a little late (right after the instructions) and accidentally connected to the test URL. After closing the browser and re-connecting via the second URL, the system then reported that the meeting participant limit had been reached. The virtual meeting was configured for the correct number of participants (including a backup computer for the recorder) but would not let the last person in. Once the recorder disconnected a backup computer, P11 was able to connect without problem.

Group 3
1. P16 was faced with substantial network connection security restrictions and was able to successfully connect, but not receive screen information in real time. As a result, the refresh button was needed to be clicked regularly to see changes being made to the assessment data during the process
2. P15 commented that the editing process used by the recorder to move around and combine ideas was sometimes a bit hard to follow.

Communication Anxiety – Form Trait-Form State Results

There were a total of seventeen participants in the three groups. Group one had five and groups two and three had six each. Four of these participants were excluded from the descriptive statistics because they each failed to answer one of the form state questions (each left a different question blank). Table 6 has a summary of the Trait Z-score, State Z-score, and the difference between the Trait and State scores for comparison organized by group.

Table 6
Form Trait Small Group and Form State scores, corresponding Z-Scores, and Z-score
Differences

Nr	Group#	Trait	Trait Z-score	State	State Z-score	Difference
P01	1	10	-1.013826081	23	-1.863921896	-0.850095815
P04	1	15	0.983104078	35	0.559176569	-0.42392751
P05	1	11	-0.614440049	29	-0.652372664	-0.037932614
P07	1	10	-1.013826081	30	-0.450447791	0.563378289
P02	2	12	-0.215054017	33	0.155326825	0.370380842
P11	2	10	-1.013826081	29	-0.652372664	0.361453417
P12	2	15	0.983104078	29	-0.652372664	-1.635476742
P13	2	11	-0.614440049	31	-0.248522919	0.36591713
P14	2	12	-0.215054017	39	1.366876057	1.581930074
P03	3	17	1.781876142	33	0.155326825	-1.626549318
P09	3	15	0.983104078	33	0.155326825	-0.827777254
P10	3	15	0.983104078	43	2.174575545	1.191471467
P16	3	10	-1.013826081	32	-0.046598047	0.967228034

Participant Survey Results

        In addition to Form State instrument, an attitudinal survey was administered to the
participants at the conclusion of the needs assessment. This twelve question survey
attempted to assess participants' impressions about the process as well as identify
perceived benefits and detractors to the process. Table 7 is a summary of the gathered
data.

Table 7
Summary of Attitudinal Survey Responses

Question	Responses
21. How comfortable were you in participating in a focus group where you could not see the other participants? (Very Comfortable, Comfortable, Uncomfortable, Very Uncomfortable)	11: Very Comfortable 6: Comfortable 0: Uncomfortable 0: Very Uncomfortable
22. If you felt uncomfortable, what made you feel uncomfortable?	No response

Table 7

Summary of Attitudinal Survey Responses

Question	Responses
23. What did you like about the process?	• Eleven participants liked not having to travel, the time savings, low cost by not having to travel, and the comfort of participating from their office. • Seven liked the ease and efficiency of the process • Four liked the technology and felt it was an improvement over traditional flip charts and white boards • Three spoke to the process' ability to allow the sharing of common goals. P02 added that "Without being able to see the other participants, I think ideas were more freely exchanged."
24. What did you dislike about the process?	• Four stated that there was nothing that they disliked about the process • P07, P12, P14, and P17 were bothered by the lack of visual contact. P14 specifically stated "No personal interaction - can not get a 'read' on people over the phone." • P05 and P16 pointed to technology glitches
25. How satisfied are you with the results of the group process? (Very Satisfied, Satisfied, Dissatisfied, Very Dissatisfied)	13: Very Satisfied 4: Satisfied 0: Dissatisfied 0: Very Dissatisfied
26. Did you feel you were a part of the process?	15: Yes 2: Very Much So P07 added "Structure approach insured that everyone participated."

Table 7

Summary of Attitudinal Survey Responses

Question	Responses
27. Should Virginia Tech use this format for conducting future needs assessments? Please explain your answer:	All answered yes. Themes included: • Seven participants expressed that it saves time/Travel/Money. It was very convenient Some quotes of note: • P08: It's a good way of assessing, and VA Tech should continue developing and refining the process. • P04: great way to capture and prioritize ideas. • P13 "very productive method of conferencing." • P12: "...Often, travel to Tech is not always feasible, but this format may make participation more likely." • P02: "Yes, as a time saving tool. However, the occasional face-to-face meeting is important in building personal relationships." • P16: "Yes if you can get the technical difficulties/issues for each participant worked out ahead of time."
28. Would you participate in a focus group with this type of format again?	All answered yes.
29. How would you rate the ease of the process of connecting to the focus group BEFORE the process began? (Easy, Fairly Easy, Somewhat Difficult, Difficult)	7: Easy 7: Fairly Easy 2: Somewhat Difficult (P01 and P16) 0: Difficult 1: Did not answer
30. How would you rate the ease of use of a computer in place of a flip chart? (Easy, Fairly Easy, Somewhat Difficult, Difficult)	10: Easy 6: Fairly Easy 0: Somewhat Difficult 0: Difficult 1: Did not answer

Table 7

Summary of Attitudinal Survey Responses

Question	Responses
31. Would additional interaction with the computer system have affected your impression of the activity?	8: No 2: Yes 2 Did not answer Additional comments of note: • P17: "There was good balance" • P07: "Multiple windows (thumbnails) which you could select as needed would broaden the visual inputs." • P11: Yes, we could have typed our responses for all to see • P06: Would have been nice to have been able to "vote" on-line maybe. • P12: Video conferencing would be nice.
32. Are there any other comments on the technical aspects of the process?	6: No/None P07: "This process requires telephone connection (and expense). Can you handle VoIP as part of the connection or does this require greater bandwidth?" P11: "It is a very helpful use of technology which could save significant local and state resources." P06: "…I had no problems with the technology." P02: "Being my fist exposure to "Microsoft Live Meeting", I was impressed." P10: "It was amazing and I think it better than using flip charts in presentations as you could change it as you needed." P17: "Again, maybe a larger font."

CHAPTER FOUR

Discussion

There were a total of seventeen participants with only thirteen of them completing the entire CAI. Such a small sample size is insufficient to apply inferential statistical analysis. However, there were a number of interesting observations which suggest avenues for future research.

Most scores presented in Table 6 fell within one standard deviation of the mean. This would indicate that the group was not sufficiently diverse in their anxiety levels. There are several possible factors that could account for this. One possible factor is that the group did not represent a random sample of the population. Participants were identified by OED as being key informants they wished to include in their assessment of southwest Virginia. While this was a random sample within southwest Virginia, it was not a random sample of all economic developers. These participants tended to be economic development professionals in very high positions within their economic development organizations. As was mentioned in the Selection of Participants section of Chapter Two, economic development often represents a form of marketing. (c.f. Swager, 1991, p. 4). Given the types of positions that many of the participants held, it would be safe to assume that these individuals would be frequently involved in small meetings and that working in an environment such as this one would be a job requirement. As such, this job necessity could serve to select out economic developers with higher levels of small group anxiety.

Despite this favorable review, there were also some comments identifying areas participants did not care for or felt that could be improved. Four respondents said they did not like not being able to see the other participants. It made it difficult for them, as one person termed it, to get a "read" on the other participants. Of the three participants that expressed this opinion and completed the CAI, two saw an increase in anxiety (the other saw a decrease). P01, P05, P08, P11, and P16 experienced technical glitches due to their interaction with the technology and P05 and P06 commented on this in the participant survey. No trend appeared to emerge related to their Trait/State scores.

Three causes were identified related to these technical difficulties. One was a flaw in how the study was conducted stemming from the final set of instructions sent to participants via e-mail. In the instructions, two URLs were provided. One went to a trial meeting so that participants could connect to Live Meeting ahead of time to test their computer and ensure that their machine would not have problems. The second URL connected to the meeting that would be used for the actual assessment. Providing both URLs in the same message did cause some confusion and one possible way to correct for this would be to send two separate messages. However, this could also become a problem if the participant were to become confused by receiving two e-mails rather than just one. The best approach might be to configure a single meeting. Users would be using the same steps that they followed during the test and the person conducting the assessment could post any desired material just prior to the beginning of the assessment. There were three participants that became confused by this, therefore correcting it is important as it will probably adversely affect the anxiety a participant might experience.

Two cases of technical difficulty were a direct result of the way in which the security of their computers or networks were configured. Newer and more stringent security placed on the operating system software as well as security restrictions created for network infrastructure, such as blocked ports and limits on streaming media, were responsible for technical difficulties experienced by participants. Another source of problems for users was web browser diversity. One might wonder if the use of technology in this setting couldn't be a source for some of the observations. There is insufficient data to state with certainty whether or not technology directly affected participant's change in anxiety. However, it is interesting to note that the majority (all but one) of the participants who experienced difficulties as a result of various technology glitches had lower participation anxiety scores. Does this mean that technical difficulties were not a factor in their anxiety or were those who experienced such difficulties not affected because of their comfort level with technology? It can be challenging to create interactive applications that will work across multiple computer platforms and operating systems. In this study, participants came from different organizations with different standards for their technology. Some had more bandwidth than others. Some had extremely stringent security settings while others were quite lax. Different offices chose to standardize on different web browsers. It seems certain that both security issues and browser diversity are likely to continue to be problems when interactions involving computer systems cross organizational boundaries.

There were a number of points of interest surrounding the lack of visual proximity to the rest of the participants. One observation centered around the answer to question 20 on the Form State Instrument which stated, "I maintained eye contact when I wanted to". In the constructed environment, eye contact was not possible. Two participants did not answer the question, twelve selected "Not At All", while three selected "Very Much". In reviewing the normalized small group trait scores of the three answering "Very Much", it was found that one of the respondents had one of the lowest small group trait anxiety scores, one had a near equally high anxiety trait score, and the third represented the highest trait anxiety score of all participants. When looking at their State scores, two showed higher State scores than were predicted while the other showed a decrease. Does this mean that the amount of eye contact is not a factor in their anxiety within this environment? Were there other factors that might account for the higher anxiety levels in the two users who felt they had maintained the desired eye contact or did they simply misread the question?

When comparing all participants' trait scores to their state scores, it was observed that individuals with low trait small group anxiety scores experience more anxiety in this environment while those with high trait anxiety scores were less anxious. Those who had an increase in anxiety increased .7 standard deviations while those with a decrease had a decrease score of .9. Perhaps those with low anxiety depend on visual feedback from those with whom they interact in order to be more calm and relaxed. That same visual feedback may be what causes other individuals to have higher Trait anxiety scores. Based on the State scores generated as a result of removing the visual element, one might surmise that removing the visual effect has a normalizing affect on the population but a larger sample would be needed to confirm this trend.

All participants were comfortable in the setting and spoke favorably of the positive aspects of conducting assessments in this manner. Some comments centered on

them not having to travel and the related cost savings, time savings, and comfort that it afforded. All participants were satisfied with the process, felt engaged, and were willing to participate in future activities using this same method of meeting. In responding to the question "What did you like about the process?" P02 replied that "Without being able to see the other participants, I think ideas were more freely exchanged." This is interesting given that P02 made this statement despite having experienced an increase in anxiety in this setting (with a score that increased by .41 standard deviations). One might infer that P02 felt the setting did not necessarily affect participation though a follow-up interview would have helped explore this further. A key to the success of any needs assessment focus group is for all of those involved to actively participate.

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APPENDICES

APPENDIX A
Additional Model Reviews

The General Models

In the early 1970's Kaufman (1972) identified three general types of models used in the field of education for identifying "the way things are", "the way things ought to be" and how to measure the difference. He referred to these as the inductive, deductive, and classic models. The difference between each was in how the "goals are identified" and the "gaps" are measured.

Inductive Model: In this model, goals are gathered from a committee comprised of members of the various district communities and educators. Then the learners' current behaviors are assessed and classified based on the initial identified goals. These goals are then compared to existing goals and the committee reconciles any discrepancies. This allows educators to set detailed objectives and develop an educational plan to meet those objectives. Finally, the education plan is implemented and, over time, the committee evaluates the educational outcomes and educators revise the plan accordingly.

Deductive Model: in this model, the educators identify the goals to be achieved and establish how measures and indicators for certain behaviors indicate when a goal has been met. Next, a committee comprised of members of the various district communities and educators determine what changes are required. Educators then gather data on performance and identify the gaps between the way things are and ought to be. As in the inductive model, educators set detailed objectives, develop an educational plan to meet those objectives, implement the plan and then revise the plan accordingly.

"Classical" Model: This is the simplest model and, according to Kaufman (1972), the most frequently used. Generic goals are identified and prioritized and then programs are developed and implemented. Finally, the programs are evaluated. All of these steps are done by the educators without any involvement from the district community and the four major elements in this model tend to be done without any basis in empirical data.

In reflecting on the three models, Kaufman states that there is nothing to indicate that neither the inductive nor deductive model is better since each has advantages and disadvantages that balance out. This allows the assessor to determine which model is the most appropriate for any given circumstances. He does go on to say that he does not recommend the use of the "classical" model, presumably because of its lack of constituent involvement. Similarities can be seen between the inductive and deductive models and the more contemporary models currently in use since they incorporate elements from both. Each involves the collection and analysis of data to help guide the decision making process. The lack of any further reference to the "classical" method in any contemporary work other than to acknowledge its existence would seem to indicate a lack of support from the research community. The fact that it is still periodically mentioned also indicates a continued use, likely due to its convenience and simplicity relative to other assessment models.

The Marketing Model

The marketing model (Marti-Costa & Serrano-Garcia, 1983; Nickens et al., 1980) is a method for conducting marketing research that will provide information about the

business to be used in an assessment of internal processes and business operations such as how service is delivered or the image of the company presented to the public (Nickens et al., 1980). The basic steps of the marketing model, as presented by Nickens, are:

1. A needs assessment committee should be established within the institution with the purpose of identifying constituencies or target groups. The community forum approach is utilized to accomplish this phase.
2. This committee then publicizes the list of target groups throughout the organization for validation. This process could be repeated (Delphi Technique) until general consensus is reached.
3. Once the validation of the target groups is accomplished, the institutional needs assessment committee selects representatives for the community forum, each of whom has expertise pertaining to a target group.
4. A sub-committee is then formed for each target group. Each sub-committee then selects the appropriate method for data collection for their particular target group.
5. Each committee then prepares a proposal as to what accomplishments are expected. Also established at this time are the size of the population and the size of the sample to be utilized.

(Nickens et al., 1980) p. 9

Nickens recommends using one or more of five approaches identified by Warheit, et al. (1975) for gathering data during this process. These methods are discussed later in the section "Traditional and Contemporary Tools for Conducting a Needs Assessment." While this model is presented in a way that addresses the business-to-consumer relationship needs, its framework is general enough to be useful to those in other fields performing an assessment at the macro level.

Figuring Things Out Model

The Figuring Things Out model (Zemke & Kramlinger, 1987) performs an assessment by analyzing major human and organizational factors that influence an individual's performance within the organization. These factors are identified within the organization, local performance environment, and the performer (see Figure 3). They consider an organization to be a semi-open system. As a result, the choices made about the organizational factors (mission, goals, strategy, tactics, and plans) are influenced "by the men, women, laws and societies around them". Despite this influence, organizations still tend to maintain their own climate and culture that must be taken into consideration.

The approach is based on the concept of two links between an organization and its employees. One is the link between the organization's objectives and the expectations it provides to the employees and the other is the reinforcement and feedback that it provides to let employees know how well they are meeting organization objectives and expectations. A secondary link they recommend analyzing is support. Support is defined as "the availability of help, counsel, and general personal psychosocial sustenance the individual is allowed to experience both as a person and as a performer or achiever within the organization" (Zemke & Kramlinger, 1987, p. 23). When conducting a study, it is important to determine the root cause for a performance problem. This is done through five types of factor analysis.

Organization		
History	**Local Performance Environment**	
Mission	Objectives	**Performer**
Goals	Expectations	Ability
Strategy	Rewards/Punishment	Skill
Tactics	Feedback	Knowledge
Plan	Support	Needs

Figure 3: Figuring Things Out Model (Zemke & Kramlinger, 1987, p. 22)

The first is the summarization of the organization's climate and culture to determine what types of effect it has on the individual or group involved in the performance problem to ensure a suitable match to the organization's mission and goals. A mismatch can be the source of performance problems requiring changes. A second analysis type is an analysis of the organization's mission and goals. Failure to understand the intent of these at the operational levels of the organization can affect "how well the mission is being translated into actions" (Zemke & Kramlinger, 1987, p. 23). A third factor is the analysis of the employee's opinions on the incentives system. This involves examining how and for what actions employees are rewarded or punished, as well as looking at the mechanisms in place to inform employees about the ways in which they are meeting performance expectations. The fourth analysis factor involves the analysis of the skills involved in a task relative to the skill possessed by the employee. This could indicate where skills training may be required or where expectations may be too high, exceeding what can be reasonably delivered by an employee. The final analysis factor involves measuring the available support that exists in the work place and its value to the organization.

Zemke and Kramlinger state that it is not typical to utilize all five analyses unless a full audit is being performed. The objectives and expectations represent the goals while the discrepancy between this and the performer's performance illustrate the need. Resolution of the performance discrepancies will, in turn, address the needs of the organization.

Training Needs Assessment Model

According to Watkins, Leigh, Et Al (1998) the training needs assessment model presented by Rossett (1987, 1991) is used by many in the business community and is paralleled by the six-step model presented by Darraugh (1991). This model seeks to identify optimals, actuals, feelings, causes, and priorities, get employees to buy in to the findings, and train management on new ways to look at problems. Optimals correspond to "the way things ought to be" or the goals to be reached. These should be the "vision of desired knowledge or performance" (Rossett, 1987, p. 15) which would be the things that an employee needs to do their work. Actuals represent "the way things are" or the initial state. The "gap", referred to as the performance discrepancies, is the difference between the optimals and actuals.

Once these are identified, the assessor should seek the "feelings" or opinions among employees, managers, and anyone else who is or might be involved in the problem. Rossett suggests that these are the stories that identify a job's successes and

failures. Gathering this information can be challenging but can provide insights into the nature of the problem. This leads the assessor to the next step of the model that is the identification of the cause or causes of the problem. Again, input should be sought from all stakeholders. The opinions on the source of the problem might not always be the same. Employees could have a very different perception of the cause of the problem than their supervisors. While gathering other data in the assessment process, data should also be gathered on stakeholders' perceptions of the problems.

As the data is being gathered, the assessor should be involving the stakeholders in the identification of the instructional product, service or other alternative prior to it being implemented. Finally, the assessor should ensure that, with training, management can look at problems so they can go beyond general objectives and mission statements and to provide employees with a more clear way of achieving the optimals.

The focus of this model is on individual and/or small group performance and does not address needs assessment at the organizational or societal level. It is also worth pointing out that most of the data collection methods suggested are qualitative in nature. Finally, this model lacks a method for identifying when the individual or group being assessed has met the optimals identified in the process.

<div align="center">Course Level Needs Assessment Model</div>

The Course Level Needs Assessment model presented by Burton and Merrill (1991) focuses on conducting an assessment in an academic setting focusing on the needs of an actual course rather than the entire academic institution and demonstrates a traditional four phase method for conducting a needs assessment as identified by Klein (Klein et al., 1973).

Phase 1. Identify a Broad Range of Possible Goals: A range of all possible goals should be identified which can be done through the use of techniques such as survey, group brain storming, Delphi, or by using existing goals. These goals should not take into account any existing situations or resources. All groups who have a stake in the process should be involved to ensure that all possible ideas and viewpoints are represented. It is important to use care in not over-generalizing the goals because if they are stated in vague terms, it will be difficult to measure the gap between "what is" and "what should be".

Phase 2. Rank Goals in Order of Importance: Prioritize the list of goals in order of importance. Again, all stakeholders should be involved in the process which can involve the use of a weight system to indicate the importance of one goal relative to others or simply number them in order of importance.

Phase 3. Identify Discrepancies Between Expected and Actual Performance: This describes the act of determining the gap between "what is" and "what should be". The first step is to identify the "initial state". These should be in measurable terms (scores on tests, current sales of widgets, measures of customer satisfaction, and so on). Once the initial state has been identified and put into measurable terms, identify the "goal state" using the same terms. The more that has been accomplished in clearly identifying specific goals in phase one, the easier this phase will be.

Phase 4. Set Priorities for Action: Determine a final priority list for the needs, based on the prioritized list of needs and the relative gaps identified. This is a form of reconciling the data gathered in phases two and three and can be arrived at using a

combination of subjective and objective methods. Since decisions are based on opinion, the stakeholders should again be involved in the process. One of the easiest ways to minimize the subjective nature of this phase is to simply use the rankings of the goals determined in phase two to set final priority. However, one must bear in mind that this would involve taking the goals, and not the relative needs, into consideration. If the goals in phase two were ranked using weights, and the gaps for each goal were expressed using the same or similar terms (where appropriate), the corresponding weights and gap values could be multiplied and used as a scale for the final ranking. There are other types of decision-making models e.g. (Edwards & Newman, 1982; Pitz & McKillip, 1984) that can be used to help in this process but they tend to be complex in their application.

Burton and Merrill offer a detailed list of inputs, operators, operations, and expected outputs of each phase in the context of a course level needs assessment (Burton & Merrill, 1991) p29-32. Inputs consist of materials available for conducting the phase, operators are the stakeholders being assessed who will participate in that phase, operations represent the tasks operators will be asked to perform and outputs are the end result of the activities in a given phase. Though this model is presented in the context of a course assessment, it is presented in a way that could easily be modified to aid in the assessment of other fields and disciplines. Burton and Merrill also acknowledge that this is a focused model for needs assessment and point out that other models in the field take into account the mega level needs that will affect society.

Investigate the Problem Model

The Software Quality Problem-Solving Process presented by Arthur (1993) provides a roadmap for improving the quality of software. The components of this process, referred to as Plan, Do, Check, and Act, are presented in the context of improving software through a problem-solving process. The first part of the process, Plan, deals with the investigation of the problem and is the focus of this section. Before the process can begin, a clear set of goals to be achieved should be developed. Once these goals are identified and defined, the assessor is now ready to begin the planning process.

Arthur states that "A problem exists anywhere there is a gap between where we are and where we want to be" (Arthur, 1993, p. 99). A matrix is to be developed to allow each problem area to be evaluated in terms of customers, products, services, processes, and measurements. Arthur advises creating a matrix using the following seven steps:

1. Brainstorm a list of next-process customers. If the list includes more than 7+/-2, multivote down to five main customers
2. For each next-process customer, brainstorm a list of products (e.g., requirements, design, code, executable programs, JLC, etc.) or services (e.g., system operation, trouble diagnosis, etc.) that your group provides.
3. For each of these products or services, list the processes used to deliver them (e.g., for code, processes might include coding, inspecting, and unit testing)
4. For all of these customers, products, and processes, identify the data and measurements available to complete a Quality Improvement story (e.g., code defects, response time, program failures, system unavailability, etc.)

5. With this complete list of next process customers, products, and processes, brainstorm a list of potential themes that could be solved using the Quality Improvement process and the available data. Multivote to 3-5.
6. Make your brainstormed themes more specific by challenging the words used in the theme and improve them by asking: Who, What, Where, Where, When, or How specifically?
7. Use consensus to select your theme. Define the words in the selected theme.

(Arthur, 1993) p. 100

In Step One, Arthur discusses the analysis of next-process customers. He defines the next-process customer as "the person who receives your output" that can be distinguished as either being a next process customer or an external customer. A next-process customer is a person who is internal to the process. A software developer's next process customer could be the supervisor who receives progress reports or the next group that must take the product and integrate it into the next piece of the overall project. It could also be the supervisor whose next process customer is the employees who receive direction and instruction from their superior. External customers would be those who are actually purchasing the software. Arthur also recommends an analysis of suppliers be conducted. The basis for this is that the software can only be as good as the resources that go into it. A supplier could be an external or internal customer who provides functional requirements, a technician who provides service to the development equipment like a computer or software, or anyone else who provides input into the process.

Steps Two and Three involve the creation of a list of products and services and the processes used to deliver them compiled by the group being studied. The purpose in creating these lists is to identify programming bugs, or defects, that may have been introduced in the current development cycle. Once the defects are identified, available data is used to locate the root causes of the defects. Arthur cautions the reader not to make the mistake of jumping too quickly to find a solution. Often, practitioners make the mistake of attacking the superficial source of the problem without delving deeper to find the true source of the defects. In Step Four, data is then gathered about each of these defects to further clarify their basic cause.

In Step Five, the resulting information gathered through these steps are then developed into themes or problem statements which can be solved using processes to improve quality and information represented by the available data. Arthur recommends keeping these to a small number so as to keep from trying to address the problem at too high a level. Focusing on smaller goals can make the problem-solving process more manageable and ensure success. Step Six seeks to further clarify the identified themes and eliminate ambiguity. Finally, Step Seven uses consensus to select the theme or themes to be addressed. Key terms are defined in the selected themes as a final step to ensure theme clarity and prevent generalization.

As has been illustrated, this model focuses on individual and/or group processes. A review of this particular model points out that the model offers many useful tools for improving existing products but suggests that "the developer should determine if the initial software development was derived from results-focused needs assessment" (Watkins et al., 1998, p. 43) before beginning the quality improvement process.

Performance Relationship Map Model

The Performance Relationship Map (Robinson & Robinson, 1995) addresses internal business needs. The authors of this model use the map as a means to identify what information to gather and areas in which data is missing, and also serves as a template for presenting information to management in organizational terms that will be familiar and easily understandable.

The model calls for the creation of a map of the components of the desired performance. Figure 4 (below) illustrates the relationship between business goals and performance, training, and work environment needs. The process starts by identifying a specific business goal or need (such as "increase stockholder dividends" or "reduce manufacturing defects") which indicates what "should be". Next, the performance outputs that are necessary to achieve the organization's business goal being studied are identified. The identification of both of these will correspond to the goals that the organization wants to achieve.
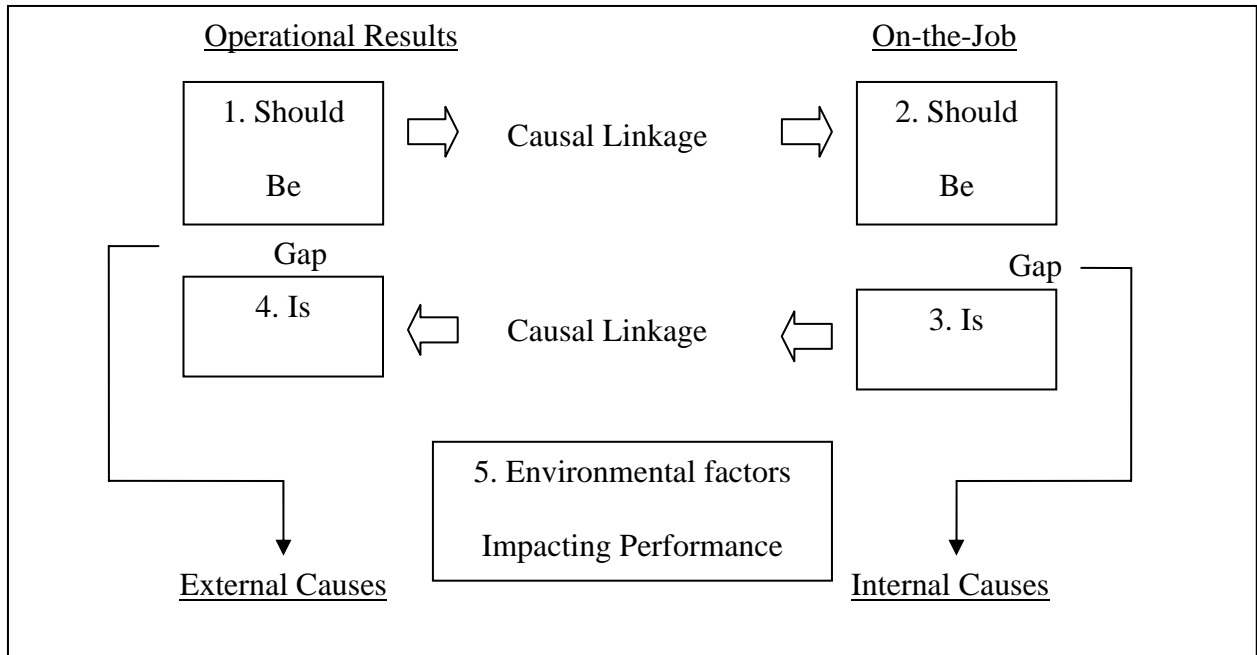
Figure 4: Performance Relationship Map (Robinson & Robinson, 1995, p. 55)

The next step is to look for the current performance outputs ("what is") and the operational results that are generated by the current performance. The difference between these is the gap in performance. Finally, internal and external factors and forces are identified that affect the performance. External factors are those which are beyond the control of the organization. For example, the sudden introduction of cheaper competition into the market could affect stock dividends by forcing the company to cut profit margins in order to remain competitive. Internal factors are those that can be manipulated and controlled by the organization. Perhaps employees do not have sufficient training to bring manufacturing defects down to the desired level or they may lack the incentives necessary to produce the extra work and effort necessary to improve the quality of output.

This model provides a very good method for analyzing internal relationships between individuals, groups, and the organization as a whole with business objectives

being the primary basis for the assessment. The authors encourage the involvement of all stakeholders in the goal identification and data gathering processes which will help in understanding the results and ensure a thorough analysis. While this model is quite good at focusing upon internal processes, it does fall short in that it does not address the needs of the organization's customers or the society in which they participate.

Three Phase Assessment Model

Witkin and Altschuld (1995) offer a three phase model for planning and conducting a needs assessment. This model is based on the concept of identifying the people and their tools by their level of need: Level 1(service receivers), Level 2 (service providers), and Level 3 (resources and solutions). They define a system as the organization that ties the elements of these three levels together. The system is often the initiator of the assessment process beginning with pre-assessment.

During phase one, or the pre-assessment phase, the existing situation is explored. A management plan is established for the assessment and its general purpose is defined. Areas of major need, relevant issues, and any other relevant information related to the needs and issues are identified. The needs assessment committee will then identify data sources and possible methods for collection as well as ways in which the data can be used. The end result should be a list of problems and a plan for assessing and solving them.

In phase two, the assessment is conducted. The first step of phase two requires that the needs areas identified in phase one be placed in context within the system and boundaries be set for the assessment. Now data can be gathered that will be assessed so that the status of the needs can be determined and need statements can be developed. This information can take the form of both facts and opinions, although it is important that care is taken so that facts and opinions are not confused. The needs are prioritized and causal factors are identified for each of the three levels of need. Those factors are then separated into those that are within the system and those that are external to the system. Finally, all data is combined and interpreted.

Phase three is referred to as a post-assessment. This part of the process begins a final prioritization of needs based on gap magnitude, level of difficulty to address, risks, costs, and other factors. Next, criteria for potential solutions should be determined. Alternative solutions should be identified and evaluated using the selected criteria. The best solutions are selected and an action plan is developed. Finally, reports are generated to evaluate the overall quality of the needs assessment.

This model significantly differs from other models in that it takes the process one step further by identifying possible solutions to a stated problem and makes recommendations on their implementation. In evaluating this model, Watkins, Leigh, et al. (1998) point out that it is primarily reactive in nature with a focus only on an internal individual or small groups. They go on to point out that while it seeks to identify and address current and future problems, it does not address current or future opportunities. Nevertheless, the model does provide a useful method for problem identification and resolution.

Organizational Elements Model

The Organizational Elements Model (Kaufman, 1982, 1988, 1998, 2000) provides a framework to address needs assessment at the societal, organizational, and individual/group level. It defines five elements that encompass an organization's resources and accomplishments. The five elements are: Inputs, processes, products, outputs, and outcomes. Inputs represent the raw materials an organization has or the constraints within which it must operate. Processes are the means, procedures, and methods available to the organization to achieve its goals. These two elements are referred to by Kaufman as quasi-needs. He makes this distinction to illustrate that one would not actually try to close inputs and processes as an activity unto themselves but rather as a means of addressing needs identified in the products, outputs, and outcomes.

The remaining elements, products, outputs, and outcomes correspond respectively to the micro, macro, and mega levels of need. Products are end results generated at the individual or small group level. An end result could be a student completing a math or history course or a worker on a production line reducing the number of manufacturing errors through specialized training or process improvement. Outputs are the products of the system or organization. These could be graduates of a degree program or better quality widgets from Company X. Outcomes represent the impact of the outputs on society or the community. By graduating a sufficient number of successful students, a college can help to provide better community leaders and more skilled workers for the workforce, improving the chances of attracting better paying jobs to the community it serves. The improvements in the manufacturing process made by Company X on its widgets could reduce the number of pollutants introduced into the water or atmosphere, improving the quality of life for residents living near the facility. These five elements are best represented in Figure 5.
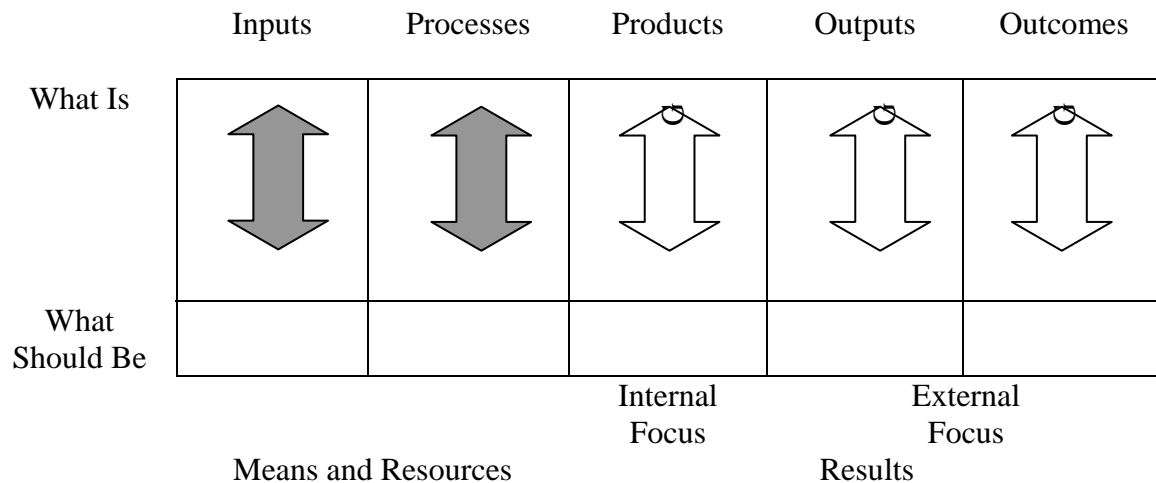

Figure 5: The Organizational Elements Model in a two-tiered framework (Kaufman, 1998, p. 113; Muri et al., 1998, April, p. 9)

The author of the model recommends that needs be assessed at the three levels of Product, Output, and Outcomes. He asserts that, while one can choose to focus on assessing needs only at the products or outputs level, doing so assumes that desired

outcomes will come as a result of the products and outputs that are achieved. Kaufman proposes these nine steps to detail the assessment process of this model:

1. Decide to plan using data from a needs assessment – The reason for this initial step is to clarify the purpose of the assessment. This is to help ensure that the assessment will focus on the ends to be achieved and not the means to achieve them.

2. Select the needs assessment and planning levels – Determine the scope. Will you be assessing the needs at the products, outputs, or outcomes level?

3. Identify needs assessment and planning partners – Identify the people who are involved in and will be affected by the results of the process. Those who will be used will differ depending on the assessment level as well as on the exact nature of the assessment. They should represent as many different aspects and perspectives on the assessment area as possible. After they have been chosen, begin listing possible needs, being careful not to confuse needs (gaps in results) with quasi-needs (gaps in resources and processes). Needs will be identified using both soft (perceived gaps) data identified by the planning partners and hard (performance gaps) data that is independently verifiable.

4. Obtain the needs assessment and planning partners' participation – Individuals identified in the previous step should be involved in and be willing to contribute to the process. They should be informed of the level of commitment involving such things as expenses, travel, or time that will be required to participate in the assessment process.

5. Obtain planning partners' acceptance of the needs assessment and planning level to be used – Be sure that the participants have a clear understanding of the scope of the assessment to be conducted. This will help participants focus their attention and will improve the outcome of the assessment process.

6. Collect needs data (internal and external) – Using both hard and soft data, measure the difference between "what is" and "what should be". Internal needs will focus on the needs of products and outputs in the system while external needs are related to outcomes.

7. List identified and documented needs – List the needs and their relevant data. Present the list to the partners and seek agreement on the list. It is important to have the partners reach a level of agreement before continuing with the process.

8. Place needs in priority order and reconcile disagreements – The needs should be placed in order of importance. This can be determined through the merging of hard and soft data. It is not unusual for the hard and soft data to disagree and when this occurs, additional data should be sought so that agreement can be reached.

9. List problems (selected needs) to be resolved and obtain agreement of partners – Review the prioritized list of needs and select the ones for action. Consideration of inputs and processes can aid in the selection process.

The flow diagram in Figure 6 provides a representation of the process and elements that must be considered. This model is most effective in addressing needs at the mega level. In its original form as represented here, the model was presented as a method for systematically conducting a needs assessment in the field of education. A more recent publication (Kaufman, 1998) shows the model in more generic terms, allowing it to be generalized to other fields beyond education.
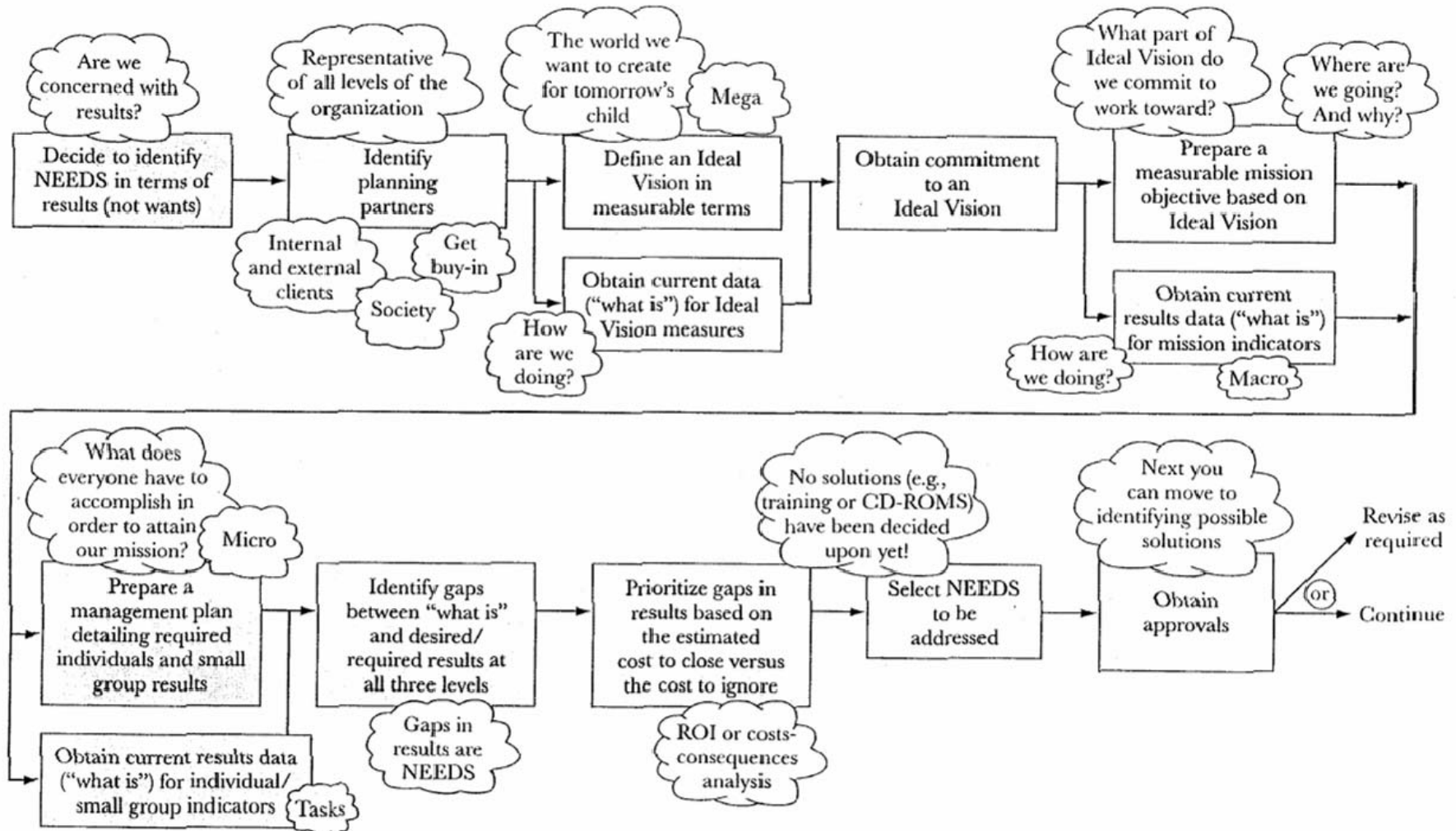
Figure 6: Flow diagram for Organizational Elements Model for conducting a needs assessment (Kaufman & Watkins, 1999, p. 239)

APPENDIX B
Economic Development

Define Economic Development
        Just what is economic development? What does it involve? In many cases, it depends on
who you ask. The American Economic Development Council defines economic development as
"the process of creating wealth through the mobilization of human, financial, capital, physical
and natural resources to generate marketable goods and services. The economic developer's role
is to influence the process for the benefit of the community through expanding job opportunities
and the tax base." ("Economic development today: A report to the profession", 1984, c.f.) The
Virginia Economic Developer's Association looks at economic development in terms of
indicators measured by the state of Virginia and offers a more detailed definition suggesting that
"The goal of economic development is to increase the tax base and provide better jobs, thus
enhancing the well-being and prosperity of the citizens of Virginia. These are the activities
measured and are ultimately how success is measured. In order to do these things, it is necessary
to create and maintain the most competitive product (sites, buildings, business climate) to attract
new businesses and to promote expansion of existing businesses" ("Why economic development
is critical to virginia's future", 2002). A final definition comes from the U.S. Department of
Commerce's Economic Development Authority which states that "economic development is
fundamentally about enhancing the factors of productive capacity - land, labor, capital, and
technology - of a national, state or local economy. By using its resources and powers to reduce
the risks and costs which could prohibit investment, the public sector often has been responsible
for setting the stage for employment-generating investment by the private sector" ("What is
economic development?" 2003).
        These definitions are all quite similar. They speak of things like tax bases, jobs, wealth,
investment, prosperity. How these goals are interpreted, however, differ from one group, locality,
or region to another. For example, one locality may have significant established industry and
commerce with very specific needs for existing industry while continuing to promote economic
growth. Another that is agrarian or rural in nature would have a different set of priorities. The
Economic Development Authority provides a useful summary of these differing viewpoints:
        Economic development encompasses a wide range of concerns. To most economists,
        economic development is an issue of more economic growth. To many business leaders,
        economic development simply involves the wise application of public policy that will
        increase U.S. competitiveness. To those who think that government should more actively
        direct the economy, economic development is a code phrase for industrial policy. To
        environmentalists, economic development should be sustainable development that
        harmonizes natural and social systems. To labor leaders, it is a vehicle for increasing
        wages, benefits, basic education, and worker training. To community-based leaders and
        professionals, economic development is a way to strengthen inner city and rural
        economies in order to reduce poverty and inequality. To public officials at state and local
        levels, economic development embodies the range of job creation programs broadened
        since the 1980s in response to the decline of federal domestic assistance. ("What is
        economic development?" 2003)

        It comes down to finding the best and most creative ways to use and promote a region's
resources to achieve economic goals. Dr. Ronald J. Swager suggests that "the entire set of

approaches to economic development practice may be considered as a specialized form of marketing." (c.f. Swager, 1991, p. 4) With the general definition and purpose of economic development defined, one can now turn to the issue of identifying those engaged in economic development as a potential population for testing.

Identification of Organizations that Engage in Economic Development
There are a wide range of entities that engage in economic development. Many are public agencies while others are private organizations or individuals. Examples of typical public offices would include chambers of commerce, county administrators, state level economic development offices, or state universities. It is quite common for states to have organizations created to promote economic development in the state. Consider Virginia. It has several offices whose direct role is to promote the state's economic development goals. These offices include the Virginia Economic Development Partnership, Virginia Department of Business Assistance, Virginia Tourism Corporation, and the Virginia Film Office. Collectively, these entities work to provide economic development through industry and commerce. The Virginia Economic Development Partnership is charged with attracting new businesses to the state while the Virginia Department of Business Assistance focuses on the retention and assistance of existing industries in the state. Tourism Corporation and the Film Office are both charged with generating additional state economic development through increased commerce within the state.
Private entities or consortiums and organizations will sometimes be formed to aid in economic development at both the state and local level. Looking again at the state of Virginia, one can find a number of statewide organizations including the Virginia Economic Developers Association, Virginia Municipal League, and Virginia Association of Counties. Some examples of local level organizations would include New River Valley Alliance, Rotary club, Lions club, and Kiwanis club. Some serve as economic development agents as smaller versions of the agencies at the state level, some through training and interaction opportunities, and others through their community service projects. Similarly, private individuals may seek to engage in economic development through political or philanthropic support.

APPENDIX C
Form Trait

Form Trait (Booth-Butterfield & Gould, 1986, Spring)

Directions: This inventory is composed of 21 statements that describe various communication events. You are asked to respond in terms of how you generally feel about these events. Please mark your response in the appropriate blank on the answer sheet. Be sure to give the response that best describes how you generally feel.

Almost Never	Sometimes	Often	Almost Always
1	2	3	4

1. * I think I communicate effectively in one-to-one situations.
2. My heart beats faster than usual when I speak out in a small group meeting.
3. * I enjoy speaking in public.
4. I avoid talking with individuals I don't know very well.
5. I think I make a poor impression when I speak at a small group meeting.
6. I feel disappointed in myself after speaking in public.
7. * I enjoy talking with someone I've just met.
8. * My body feels relaxed when I speak during a small group meeting.
9. I avoid speaking in public if possible.
10. My body feels tense when I talk with someone I don't know very well.
11. * I speak out during small group meetings.
12. I am terrified at the thought of speaking in public.
13. My heart beats faster than usual when I talk with someone I've just met.
14. * I enjoy talking at a small group meeting.
15. * I make a good impression when I speak in public.
16. * I would like to have a job that requires me to talk often on a one-to-one basis.
17. I feel disappointed in my efforts to communicate at a small group meeting.
18. My body feels tense and stiff when I speak in public.
19. When conversing with someone on a one-to-one basis, I prefer to listen rather than to talk.
20. I avoid talking during small group meetings.
21. * I look forward to speaking in public.

Scoring: reverse "*" items then
Dyadic - sum of 1, 4, 7, 10, 13, 16, and 19.
Small Group - sum of 2, 5, 8, 11, 14, 17, and 20.
Public Speaking - sum of 3, 6, 9, 12, 15, 18, and 21.

APPENDIX D
Form State

Form State (Booth-Butterfield & Gould, 1986, Spring)

Directions: The following items describe how people communicate in various situations. Choose the number from the following scale that best describes how you felt during the communication experience you just completed.

Not At All	Somewhat	Moderately So	Very Much So
1	2	3	4

1. I felt tense and nervous.
2. * I felt self-confident while talking.
3. * While talking, I was afraid of making an embarrassing or silly sip of the tongue.
4. I worried about what others thought of me.
5. * I felt calm when I was talking.
6. I felt ill at ease using gestures when I spoke.
7. I could not think clearly when I spoke.
8. * My listener(s) seemed interested in what I had to say.
9. * I felt poised and in control while I was talking.
10. My body felt tense and stiff while I was talking.
11. My words became confused and jumbled when I was speaking.
12. * I felt relaxed when I was talking.
13. - My fingers and hands trembled when I was speaking.
14. I felt I had nothing worthwhile to say.
15. I had a "deadpan" expression on my face when I spoke.
16. I found myself talking faster or slower than usual.
17. *While speaking, it was easy to find the right words to express myself.
18. I felt awkward when I was talking.
19. My heart seemed to beat faster than usual.
20. * I maintained eye contact when I wanted to.

Scoring : reverse "*" items then sum all items.

APPENDIX E
Participant Survey

1. How comfortable were you in participating in a focus group where you could not see the other participants?
   Very Comfortable, Comfortable, Uncomfortable, Very Uncomfortable
2. If you felt uncomfortable, what made you feel uncomfortable?
3. What did you like about the process?
4. What did you dislike about the process?
5. How satisfied are you with the results of the group process?
   Very Satisfied, Satisfied, Dissatisfied, Very Dissatisfied
6. Did you feel you were a part of the process?
7. Should Virginia Tech use this format for conducting future needs assessments?
   Please explain your answer:
8. Would you participate in a focus group with this type of format again?
9. How would you rate the ease of the process of connecting to the focus group BEFORE the process began?
   Easy, Fairly Easy, Somewhat Difficult, Difficult
10. How would you rate the ease of use of a computer in place of a flip chart?
    Easy, Fairly Easy, Somewhat Difficult, Difficult
11. Would additional interaction with the computer system have affected your impression of the activity?
12. Are there any other comments on the technical aspects of the process?

APPENDIX F
Invitation to Participate

From: Settle, Ted
Sent: Thursday, September 23, 2004 8:59 AM
To: XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Cc: Farmer, Scott; Settle, Ted
Subject: invitation

Greetings economic development colleagues,
As part of the responsibilities associated with our continuing grant from the Economic
Development Administration, the Office of Economic Development at Virginia Tech is
conducting a needs assessment in Southwest Virginia. The question to be addressed by the
assessment is: What are the top four economic development issues in your community?

I would like to invite your participation in the assessment process. We are asking you to do the
following:

- Register on-line (5 minutes)
- Complete a study consent form and pre-assessment survey to gauge your typical
  communication anxiety (5 minutes)
- Join in a conference call to conduct the needs assessment (60 minutes)
- Complete a post-assessment survey to measure your communication anxiety during the
  process and your impressions of the assessment process (5 minutes)

This research project will also explore the use of technology as part of the assessment process.
Specifically, during the conference call, your web browser will serve as a flip chart. This will
facilitate the assessment and ascertain participants' experiences when interacting with the
technology.

In return for your participation, you will:

- Receive a summary of the assessment results
- Experience a technology-based needs assessment methodology

I hope you will assist us in this research project. Please contact me by Friday, October 1 (540-
231-5278, settle@vt.edu) regarding your willingness to participate.
Thank you for considering this request.

Ted Settle, Director
Office of Economic Development
Virginia Tech
New address effective April 1, 2004:
702 University City Blvd (0373)
Blacksburg, VA 24061
(o) 540-231-5278
(f) 540-231-8850
(e) settle@vt.edu

APPENDIX G
Follow-up Invitation to Participate

From: Settle, Ted
Sent: Sunday, October 10, 2004 9:24 AM
To: XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Cc: Farmer, Scott; Settle, Ted
Subject: invitation
Economic development colleagues,
Just checking-in with you, as I have not received a response about your willingness to participate in the research study mentioned below. Please let me know by Wednesday, October 13, as we are anxious to begin the study.
Thanks for your consideration.
ted
9/23
(A copy of the original Invitation cited in APPENDIX F was inserted here)

APPENDIX H
Thank you for Agreeing to Participate

From: Settle, Ted
Sent: Friday, October 22, 2004 7:03 AM
To: XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Cc: Farmer, Scott
Subject: needs assessment research study
Economic Development Colleagues,
Thank you for agreeing to participate in the needs assessment and research study. Scott Farmer, a doctoral student at Virginia Tech, is working with me on this project and will contact you shortly with a list of three possible dates and times for the conference call as well as additional details about the overall study process.

I believe the information from this assessment will be quite useful in helping Virginia Tech to better understand your needs and to define a potential role for the university. Again, thank you for agreeing to participate. If you have any questions, please feel free to contact me.
ted
Ted Settle, Director
Office of Economic Development
Virginia Tech
New address effective April 1, 2004:
702 University City Blvd (0373)
Blacksburg, VA 24061
(o) 540-231-5278
(f) 540-231-8850
(e) settle@vt.edu

APPENDIX I
Thank you for Agreeing to Participate

From: Farmer, Scott
Sent: Tuesday, November 02, 2004 10:38 AM
To: XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Cc: Settle, Ted
Subject: RE: needs assessment research study
Economic Development Colleagues,
Thank you again for participating in the economic development research project. I am working closely with Ted Settle and will be coordinating the effort on his behalf.

This note includes more details about the assessment and dates for conducting the assessment. You will be participating in the assessment with your phone and a web browser. Communication will be via conference call; the web browser will serve as a white board.

The Project
For the project, you will need to complete two surveys. The first consists of a consent form required by the university and a survey that assesses your communication confidence in various settings. You can access the survey at http://www.econdev.vt.edu/needsassessment/ . Please be sure to answer all questions. It should take no more than 5 minutes to complete and **needs to be completed by November 10**.

The second survey will occur immediately after the conference call to measure your communication confidence during the actual assessment and your impressions of the process. It, too, will take no more than five minutes.

Date/Time for Assessment
We need to select a time to conduct the assessment. Three possible dates and times have been identified:
December 7: 1:30PM-2:30PM
December 9: 1:30PM-2:30PM
December 15: 1:30PM-2:30PM
Please reply to this e-mail and let me know by November 10 which of these dates and times you are or could
be available. Once I hear from everyone, I will set the final date and let everyone know. When the date arrives,
the conference call will be initiated, the assessment conducted, and the final survey completed.
If you have any problems or questions, please let me know, and I will be happy to help. Again, thank you for
agreeing to participate.
Scott Farmer
Manager, Technology Services
Outreach and International Affairs, Virginia Tech

APPENDIX J
Participant Consent Form
DISTANCE LEARNING 2-WAY AUDIO AND ITS IMPACT ON COMMUNICATION
WITHIN NEEDS ASSESSMENT GROUP PROCESSES
Study Participation Consent Form

Purpose

It is the desire of researchers at Virginia Tech to identify new and better ways to help conduct needs assessments among the community it serves. While the Office of Economic Development (OED) is greatly interested in your participation and contribution to their needs assessment, this study is focused on the actual process and observing and evaluating your experience where technologies, specifically a telephone and web browser, are used to allow you to attend remotely from your office rather than driving to a central location.

Procedures

This study will use surveys and observation techniques to gather relevant data. In order to participate, you will need to be able to conduct a phone conversation while simultaneously looking at a web site. Should you agree to participate, you will need to complete an initial survey requiring about 10 minutes of your time. This survey will measure your typical communication confidence in various settings. You will then be contacted by an OED staff member to determine possible times where you would be available for an hour to participate in the needs assessment.

When the scheduled date and time for the assessment arrives, you will be directed to a web site and then asked to call a 1-800 number so that you can join the conference call for the needs assessment. The web site you are directed to will take the place of the traditional flip chart. An OED staff member will type in all assessment ideas as they are mentioned and will manipulate the list at the direction of the group as the process unfolds. You will not be required to interact with the web site in any way other than to perhaps scroll in the event there is more information than can fit on your screen (Just like when viewing any other web site).

The actual assessment conducted by OED will take about 40 to 45 minutes. The audio of this part will be recorded for later review to see if there were any problems encountered by you or any of the other participants as a result of the technology used to facilitate the process (i.e. ? things that would not have occurred if everyone had been sitting in the same room). The recordings will be reviewed within 30 days of the conclusion of the assessment and will then be destroyed.

At the conclusion of the assessment, you will be asked to complete an exit survey. This survey will measure your level of communication confidence during the assessment process and ask your impressions of the overall process. The survey is expected to take about 15 to 20 minutes to complete.

Benefits

Many professional agree about the value of conducting a needs assessment but sometimes find it difficult to use this tool due to the scheduling difficulties, especially when participants are

geographically dispersed. One of the possible outcomes of this study is that it could provide useful insight to the potential benefits of using readily available technologies to help facilitate assessments in a way that is mindful of the value of your time.

Risks

There are no known risks as a result of this study. It only seeks to observe the assessment being conducted by OED, gather information about your comfort communicating during the assessment, and your personal impressions about the process.

Anonymity and Confidentiality

You will be asked to supply your e-mail address as a part of each survey you complete. This will allow your survey scores to be kept together and will not be used for any other purpose. There will also be no mention of this information or individual's names in the final study report and all effort will be made to preserve the anonymity of all participants of this study.

Withdrawal from Study

In the event that you find you are unable to attend the process and/or you decide you do not wish to participate in this study, please inform Dr. Settle and any information currently provided by you will be destroyed and will not be included in the study.

If you have questions concerning any aspect of this research you may contact:

Advisor: Dr. Glen Holmes - (540) 231-1802 (e-mail: holmesg@wssu.edu)
Investigator: Scott Farmer- (540) 231-5633 (e-mail: sdf@vt.edu)

Department IRB Representative : Dr. Barbara Lockee - (540)-231-9193 (e-mail: lockeebb@vt.edu)
University IRB Representative: Dr. David Moore - (540) 231-4991 (e-mail: moored@vt.edu)

<div align="center">

Participation Agreement

</div>

If you agree to participate in this study, please enter your name, e-mail address, and phone number in the blanks below and click the button labeled "Submit". Please use the same address when completing the surveys for this study. By clicking the "Submit" button, you are indicating you have read the above statement, printed a copy for your files, you agree to participate, and you understand that this personal information will be submitted electronically back to the researcher and that it will only be used for the purpose of this study.

    Name: _____
Phone Number: _____
E-Mail Address: _____
SUBMIT

_____

Upon completion of the consent they received the following text which directed them to the Form Trait (Appendix D) survey instrument:
<div align="center">THANK YOU FOR AGREEING TO PARTICIPATE.</div>
Please click here to complete the initial survey for the study.

APPENDIX K
Pre-Needs Assessment Meeting Notice

From: Farmer, Scott
Sent: Monday, January 17, 2005 7:13 AM
To: XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Cc: Settle, Ted
Subject: RE: needs assessment research study
Economic Development Colleagues,
I would like to touch base with you to remind you that the meeting for our the needs assessment
is this Tuesday, January 18 from 2pm to 4pm. I will be calling each of you either Monday or
Tuesday morning to ask you to connect to http://www.econdev.vt.edu/JoinTest/ to ensure that
you will not have any technical problems connecting to web site that will be facilitating the white
board for our meeting.
At 2pm, you will go to the web address http://www.econdev.vt.edu/JoinNA/ You will then call in
to 800-337-3137 and use the passcode 5278 to join the conference call. Once all participants
have connected, the assessment will begin.
As a reminder, the question to be addressed by this assessment is:
What are the top four economic development issues in your community?
Thank you and we look forward to getting your insight on Tuesday.
Scott Farmer
Manager, Technology Services
Outreach and International Affairs, Virginia Tech

APPENDIX L
Focus Group Presentation and Assessment Results

Presentation

Purpose

- Determine the Economic Development Needs in Southwest Virginia
- Explore new meeting technology
- Aid in Scott's research efforts

Office of Economic Development
Virginia Tech

Role Call

- XXXXXX
- XXXXXX
- XXXXXX
- XXXXXX
- XXXXXX
- XXXXXX
- Ted Settle
- Scott Farmer (recorder)

Office of Economic Development
Virginia Tech

Agenda and Rules (1-4)

Identify gaps (Time: 15-20 minutes)

- Ideas will be solicited in a round robin fashion until all ideas are presented or time has expired.

- Ideas will not be discussed at this time

- No new items will be added to the list after this point

Office of Economic Development
Virginia Tech

Agenda and Rules (2-4)

Filter duplicates (Time: 10 minutes)

- As a group, we will identify and eliminate duplicates

- Discussion will be limited to identifying/eliminating duplicates

Office of Economic Development
Virginia Tech

Agenda and Rules (3-4)

Prioritize list (Time: 30 minutes)

- Floor will open up for discussion of the topics listed
- At the end of the discussion, each participant will have five votes to pick their top five in order.
- Open discussion is allowed on the items on the list

Office of Economic Development
Virginia Tech

Agenda and Rules (4-4)

Conclusion (Time: 5-10 minutes)

- Thank you for your input
- Complete an exit survey

Office of Economic Development
Virginia Tech

Group 1 Assessment Results
        [Ideas]
What are the top four economic development issues in your community? (Ideas)
1. Securing high paying career oriented jobs
2. Good quality prospect flow/leads
3. Maintaining a well trained workforce
4. How do we identify cutting edge industrial groups to prospect
5. Continued development of state-of-the-art businesses for the Lonesome Pine Technology Park
6. Providing sufficient Employment base for industry
7. Ongoing work foce development/support for existing and new businesses
8. Identify product for the prospect (land, etc)
9. Maintaining a quality workforce
10. Development of a child care facility
11. Providing a necessary infrastructure to attract industry
12. Continuing support from our state, federal, and regional partners
13. Ensure that we have the right technology infrastructure for the new park
14. Comprehensive approach to entrepreneurial development
15. Deployment of broadband fiber to provide redundant telecommunication service
16. Development of commercial base
17. Resolution of enterprise zone issues
18. Need a formal program to take advantage of our hub zone status
19. Continued development of relationships with Mtn Empire and UVA wise to exploit educational opportunities
20. Easy access to capital funding
        [Filter]
What are the top four economic development issues in your community? (Filter)
1. Securing high paying career oriented jobs
4. How do we identify cutting edge industrial groups to prospect and ensure good quality prospect leads/flow
5. Continued development of state-of-the-art businesses for the Lonesome Pine Technology Park
6. Providing sufficient Employment base for industry
7. Ongoing quality work force development support for existing and new businesses
8. Identify product for the prospect (running out of developable land, etc)
10. Development of a child care facility
11. Provide appropriate infrastructure, including technology, to attract industry, business, entrepreneurs
12. Continuing support from our state, federal, and regional partners
14. Comprehensive approach to entrepreneurial development
16. Development of commercial base
17. Resolution of enterprise zone issues
18. Need a formal program to take advantage of our hub zone status
19. Continued development of relationships with Mountain Empire and UVA wise to exploit educational opportunities
        [Prioritize]

What are the top four economic development issues in your community? (Prioritize)

1. Securing high paying career oriented jobs through continued development of state-of-the-art business and industrial parks/clients
4. How do we identify cutting edge industrial groups to prospect and ensure good quality prospect leads/flow
6. Providing sufficient Employment base for industry
7. Ongoing quality work foce development support for existing and new businesses
8. Identify product for the prospect (running out of developable land, etc)
10. Development of a child care facility
11. Provide appropriate infrastructure, including technology, to attract industry, business, entrepreneurs
12. Continuing support from our state, federal, and regional partners
14. Comprehensive approach to entrepreneurial development
16. Development of commercial base
17. Resolution of enterprise zone issues
18. Need a formal program to take advantage of our hub zone status
19. Continued development of relationships with Colleges and Universities to exploit educational opportunities

[Conclusion]
Totals   Question

16   1.   Securing high paying career oriented jobs through continued
                development of state-of-the-art business and industrial parks/clients

9   11.   Provide appropriate infrastructure, including technology, to attract
                industry, business, entrepreneurs

7   4.   How do we identify cutting edge industrial groups to prospect and ensure
                good quality prospect leads/flow

5   19.   Continued development of relationships with Colleges and Universities to
                exploit educational opportunities

4   7.   Ongoing quality workforce development support for existing and new
                businesses

2   6.   Providing sufficient Employment base for industry 2   10. Development
                of a child care facility

2   16.   Development of commercial base

2   17.   Resolution of enterprise zone issues

1   12.   Continuing support from our state, federal, and regional partners

0   8.   Identify product for the prospect (running out of developable land, etc)

0   14.   Comprehensive approach to entrepreneurial development

0   18.   Need a formal program to take advantage of our hub zone status

Group 2 Assessment Results
        [Ideas]
1. State support/recognition of the western part of the state
2. Decline in manufacturing
3. Resources for promotion and outreach
4. Providing the trained workforce that our existing employers need
5. Infrastructure (capacity to meet prospect needs): Generic
6. Partnerships from one locality to the next as well as with the state
7. Site and building availability across all classes (current inventory is not sufficiently broad)
8. Costs associated with being an independent city
9. Incentives (state and local) to be more competitive for recruiting/retaining industry
10. Low number of adults with a high school diploma
11. Availability of graded sites in the mountains
12. Regional vision for what kind of community we want to be down the road
13. Utilization of Virginia Tech
14. Highest and best use of available land
15. Public/private product development
16. Overcoming obstacles for commercial development in tourism to develop the tax base
17. Soft skills of the work force (dependability)
18. Knowledge about local assets (one locality may be unaware of their neighbor is doing)
19. Globalization and its effect on low/middle class jobs
20. Decline in revenue from the state to the agencies and localities
21. Need for a more robust regional/revolving loan fund
22. Advanced technology based skills and technical assistance for manufacturing
23. Future of the enterprise zone
        [Filter]
1. State support/recognition to meet the specific needs of the region (i.e. - capital [revolving loan fund], financial incentives, development of prospects, etc)
2. Transition from traditional to technology based manufacturing (i.e. - capital, workforce, technical assistance)
3. Resources for promotion and outreach beyond current efforts at the state level and become more self-reliant
4. Work force preparedness and training (including soft, hard, literacy, advanced technology skills and good work behaviors)
5. A broader base of site and building products, including public/private partnerships, that are ready to go
6. Jurisdictional partnerships from one locality to the next as well as with the state
13. Utilization of higher education institutions (for example: Take advantage of VT partnerships with companies, assisted research for local companies, workforce, utilization of graduates and dropouts, etc)
16. Overcoming obstacles for commercial development and tourism to develop the tax base
18. Knowledge about local assets (one locality may be unaware of their neighbor is doing)
20. Decline in revenue from the state to the agencies and localities
        [Prioritize]
What are the top four economic development issues in your community? (Prioritize)

1. State support/recognition to meet the specific needs of the region (i.e. - capital [revolving loan fund], financial incentives, development of prospects, etc)
2. Transition from traditional to technology based manufacturing (i.e. - capital, workforce, technical assistance)
3. Resources for promotion and outreach beyond current efforts at the state level and become more self-reliant
4. Work force preparedness and training (including soft, hard, literacy, advanced technology skills and good work behaviors)
5. A broader base of site and building products, including public/private partnerships, that are ready to go
6. Jurisdictional partnerships from one locality to the next as well as with the state
7. Lack of attention to existing industry and entrepreneurs with new businesses
13. Utilization of higher education institutions (for example: Take advantage of VT partnerships with companies, assisted research for local companies, workforce, utilization of graduates and dropouts, etc)
16. Overcoming obstacles for commercial development and tourism to develop the tax base
18. Knowledge about local assets (one locality may be unaware of their neighbor is doing)
20. Decline in revenue and increasing mandate from the state to the agencies and localities takes away from local economic development funding

[Conclusion]
Totals   Question

13   1.   State support/recognition to meet the specific needs of the region (i.e. -
               capital [revolving loan fund], financial incentives, development of
               prospects, etc)

11   4.   Work force preparedness and training (including soft, hard, literacy,
               advanced technology skills and good work behaviors)

9   3.   Resources for promotion and outreach beyond current efforts at the state
               level and become more self reliant

5   5.   A broader base of site and building products, including public/private
               partnerships, that are ready to go

5   7.   Lack of attention to existing industry and entrepreneurs with new
               businesses

5   20.   Decline in revenue and increasing mandate from the state to the agencies
               and localities takes away from local economic development funding

4   18.   Knowledge about local assets (one locality may be unaware of what their
               neighbor is doing)

3   2.   Transition from traditional to technology based manufacturing (i.e. -
               capital, workforce, technical assistance)

3   13.   Utilization of higher education institutions (for example: Take advantage
               of VT partnerships with companies, assisted research for local
               companies, workforce, utilization of graduates and dropouts, etc)

2   6.   Jurisdictional partnerships from one locality to the next as well as with
               the state

0   16.   Overcoming obstacles for commercial development and tourism to
               develop the tax base

Group 3 Assessment Results
    [Ideas]
What are the top four economic development issues in your community? (Ideas)
1. Regional Cooperation and Promotion
2. Lack of Product
3. Lack of support services like market rate housing
4. Lack of financing resources for entrepreneurial start up
5. Lack of developable sites
6. Work force development issues
7. Lack of a comprehensive incentive program
8. Lack of adequate funding for incentive programs
9. Perception/stereotypes of the area when it is being marketed
10. Lack of support amenities (i.e. - retail, restaurants, etc)
11. Develop ways to exploit proximity to VT to enhance economic development opportunities
12. Lack of knowledge of the role of international in economic development
13. Lack of support services for entrepreneurial business plan development
14. Transition from traditional manufacturing to technology manufacturing related jobs
15. Need for training facilities similar to the one in Southside (IALR in Danville)
16. Creative incentives for site redevelopment (change use of existing/old structures)
17. Work more closely with existing businesses and industries to help them grow in our region
18. Lack of a funding program to develop services and businesses similar to those for industrial
    sites/buildings/infrastructure
19. Improvement of image to VEDP (more prospects)
20. Lack of competitive wages relative to rest of state
21. A plan to tie together tourism activities
22. Focus on Job retention activities
23. Poor transportation infrastructure (air)
24. Stop the outflow of our best and brightest to the rest of the state after finishing education
    [Filter]
What are the top four economic development issues in your community? (Filter)
1. Regional Cooperation and Promotion
5. Lack of developable sites and buildings including incentives for redevelopment of
    existing/old structures
6. Work force development issues including training facilities
7. Lack of a comprehensive and adequately funded incentive program
9. Perception/stereotypes of the area when it is being marketed to VEDP, consultants, and
    others
10. Lack of support amenities (i.e. - retail, restaurants, affordable housing, etc)
12. Lack of knowledge of the role of international in economic development
17. Work more closely with existing businesses and industries to help them grow in our region
21. A plan to tie together tourism activities
23. Poor transportation infrastructure (air)
4. Lack of financing resources for entrepreneurial start up
11. Develop ways to exploit proximity to VT to enhance economic development opportunities
13. Lack of support services for entrepreneurial business plan development
14. Transition from traditional manufacturing to technology manufacturing related jobs

18. Lack of a funding program to develop services and businesses similar to those for industrial sites/buildings/infrastructure
20. Lack of competitive wages relative to rest of state
24. Stop the outflow of our best and brightest to the rest of the state after finishing education
    [Prioritize]

What are the top four economic development issues in your community? (Prioritize)
1. Regional Cooperation and Promotion
4. Lack of financing resources for entrepreneurial start up
5. Lack of developable sites and buildings including incentives for redevelopment of existing/old structures
6. Work force development/retention issues including training facilities, support amenities, competitive wages, and existing employers
7. Lack of a comprehensive and adequately funded incentive program
9. perception/stereotypes of the area when it is being marketed to VEDP, consultants, and others
11. Develop ways to exploit proximity to VT to enhance economic development opportunities
12. Lack of knowledge of the role of international in economic development
13. Lack of support services for entrepreneurial business plan development
14. Transition from traditional manufacturing to technology manufacturing related jobs
18. Lack of a funding program to develop services and businesses similar to those for industrial sites/buildings/infrastructure
21. A plan to tie together tourism activities
23. Poor transportation infrastructure (air)

[Conclusion]
Totals   Question

19	6.	Work force development/retention issues including training facilities, support amenities, competitive wages, and existing employers
14	5.	Lack of developable sites and buildings including incentives for redevelopment of existing/old structures
8	7.	Lack of a comprehensive and adequately funded incentive program
4	18.	Lack of a funding program to develop services and businesses similar to those for industrial sites/buildings/infrastructure
3	1.	Regional Cooperation and Promotion
3	11.	Develop ways to exploit proximity to VT to enhance economic development opportunities
3	14.	Transition from traditional manufacturing to technology manufacturing related jobs
2	23.	Poor transportation infrastructure (air)
1	4.	Lack of financing resources for entrepreneurial start up
1	9.	perception/stereotypes of the area when it is being marketed to VEDP, consultants, and others
1	12.	Lack of knowledge of the role of international in economic development
1	13.	Lack of support services for entrepreneurial business plan development
0	21.	A plan to tie together tourism activities

APPENDIX M
Participants' Form Trait and Form State Scores

Table 8
Participant Form Trait Small Group scores

Participant	Q. 2	Q. 5	Q. 8	Q. 11	Q. 14	Q. 17	Q. 20	Total
				Group 1				
P07	1	1	2	2	2	1	1	10
P08	2	1	1	1	2	2	1	EXCLUDED
P01	1	2	1	1	2	2	1	10
P04	2	2	3	2	2	2	2	15
P05	1	1	2	2	2	1	2	11
				Group 2				
P14	1	1	3	1	3	2	1	12
P12	1	2	2	3	3	2	2	15
P13	2	1	3	2	1	1	1	11
P02	2	2	1	1	3	1	2	12
P11	2	1	2	2	1	1	1	10
P06	2	2	3	2	2	2	2	EXCLUDED
				Group 3				
P10	2	2	3	2	3	2	1	15
P09	3	2	3	2	2	2	1	15
P17	1	1	2	3	2	1	1	EXCLUDED
P16	2	1	2	1	1	2	1	10
P03	2	2	3	3	3	2	2	17
P15	1	1	2	1	2	1	1	EXCLUDED

Table 9

Participant Form State scores

Participant	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Total
Group 1																					
P07	1	1	4	1	1	4	1	1	1	1	1	1	1	1	1	1	2	1	1	4	30
P08	1	2	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	N/A	EXCLUDED
P01	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	23
P04	1	4	4	1	4	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	32
P05	1	1	4	1	1	1	2	1	1	1	1	1	1	1	1	2	2	1	1	4	29
Group 2																					
P14	1	3	3	2	3	1	2	3	3	1	2	2	1	1	1	1	3	1	1	4	39
P12	1	2	4	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	4	29
P13	1	2	4	2	1	1	1	1	1	1	1	1	1	1	1	2	3	1	1	4	31
P02	1	4	4	1	1	1	1	1	1	1	2	1	1	1	3	1	2	1	1	4	36
P11	1	1	4	2	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	4	39
P06	1	3	3	2	1	1	1	3	2	1	1	2	1	1	1	1	2	1	1	N/A	EXCLUDED
Group 3																					
P10	1	2	4	1	3	2	2	3	3	1	2	2	1	2	2	2	3	2	1	4	43
P09	1	1	4	1	2	1	1	1	1	1	3	1	1	1	3	1	2	2	1	4	33
P17	1	3	4	1	4	N/A	2	2	2	1	2	1	1	1	1	1	3	1	1	4	EXCLUDED
P16	1	4	3	3	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	4	32
P03	2	1	3	1	1	1	2	1	2	2	1	2	1	3	1	2	2	2	2	1	33
P15	4	1	4	1	1	1	1	2	N/A	1	1	1	1	2	4	1	4	1	1	4	EXCLUDED

APPENDIX N
Research Overview Approved by Virginia Tech IRB

This study seeks to describe participants experience when participating in a needs assessment group process and using distance learning technologies to facilitate all communication. In looking at data gathering methods, the literature identifies that after surveys, group processes are the most frequently used methods for gathering data with the Nominal Group Technique being the most popular of group processes. The literature builds the case for the importance of participation in group processes as the key to its success. Using the concepts of distance learning interactions and the types of communication, the literature lays the groundwork for using technology to facilitate these processes. However, there does not appear to be discussion on how using distance learning technologies in a focus group impact individual's communication apprehension or their perceptions in terms of the actual process or its success. This study proposes to provide additional information in this area by conducting a focus group for a needs assessment and describing various aspects of that process as it unfolds. A traditional focus group will have verbal, non-verbal, and written forms of communication. This study will create an environment that will provide both verbal and written forms of communication using technology but the non-verbal form of communication will be absent. Participants will not be able to read facial expressions, use body language in their communication, or give or receive any other non-verbal cues during the process. They will also lack proximity to other participants during this process. The study will attempt to observe any differences in their communication anxiety levels from what would be expected and gauge the participants' feelings about the overall process. These observations will be guided by the desire to answer the following research question:

What is the nature of an individual's focus group participation when technology is used to facilitate communication among the group?

The data to be gathered for this study will involve the use of three surveys as the primary method for gathering information about participants. Two are the Form-Trait and Form-State which are part of the Communication Anxiety Inventory to measure trait and state communication apprehension. Research has shown that scores on Form Trait can serve as a reasonable predictor of scores on Form State. The third survey is an evaluation form designed to gauge participants' impressions of the process' success, strengths and weaknesses, their participation, and ease interacting with the technology used to facilitate the focus group.

An invitation will be sent to request participation in the focus group study and will state the topic to be assessed. It will also include a consent form that will describe the purpose of this study which is to be signed and sent back if the individual wishes to participate. Upon agreeing to participate, they will be administered the Form Trait instrument. Once participants have been identified, dates will be set for the focus groups to meet and two groups of six to ten people per group will be formed.

When the scheduled time for a given focus group arrives, the recorder will call the participants, direct them to a web site to receive written feedback, and then connect them in to the group conference call. Once everyone is connected, the facilitator will welcome everyone and then state the goals of the focus group and the rules of engagement. The facilitator will then begin to solicit ideas from the group. The facilitator will call on each participant in a round-robin fashion asking for a single idea per turn on the topic. In this stage, ideas will only be listed, not discussed. If a participant has no more ideas, they may "pass". The recorder will record the ideas

in a program that will show up on participants' web browsers. Once all ideas have been recorded or the time for this phase has expired, the facilitator will ask participants to review the list on their screens and see if each item represents a distinct idea or if there are ones that really represent the same notion. The recorder will update the list per the instructions of the group as any duplicates are resolved or removed. Once the group agrees that the list has been paired down, the group will prioritize the list in order of importance to the group. Again, the recorder will make updates to the list as directed by the group. When the list has been prioritized, the facilitator will bring the focus group portion of the process to a close. They will then instruct the participants to complete Form State and the evaluation survey to help with the evaluation of the process and bring the activity to a close.

(item 6) In addition to the surveys, the audio from the conference calls will be recorded for later review to identify and document any problems participants might have had as a result of using technology to facilitate communication. Once reviewed and any problems are cataloged, the tapes will be destroyed. As participants' trait and state scores, as well as their evaluation, will need to be matched to aid in the analysis, their surveys will be uniquely identified by participants' e-mail addresses. This identification will be used for the sole purpose of matching these scores, all attempts will be made to ensure anonymity and no identifying information will be reported in the study findings. In the event that an individual's results needs to be referenced, a pseudonym will be used. Once the results have been prepared, they will be available to all participants wishing to view them.