

Research Centers as Modes of Technology Transfer between the University and Industry and  
the Implications for Public K-12 Schools

Jeffrey Bryan Early

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Glen I. Earthman, Co-Chair

Lisa G. Driscoll, Co-Chair

Richard G. Salmon

Rosalie M. Martin

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Abstract

The Institute for Advanced Learning and Research (IALR) is located in the south central region of Virginia commonly known as “Southside”. The IALR was established in 2002 by the Code of Virginia for the primary purpose of revitalizing this economically distressed area of Virginia. The education of the citizenry of this area is central to this purpose. One method of providing for this purpose is partnering with the school divisions within the service region of the IALR to provide increased access to educational opportunities. The service region of the IALR includes eight school divisions. The purpose of this study was to determine the perceived needs of K-12 educators in the service region of the IALR in Southside Virginia. Teachers, principals, superintendents, and directors of instruction from each school division in the study area received a hyperlink to a separate survey instrument in which items were selected for inclusion that likely match the participant’s knowledge based upon his or her job title. Specifically, they provided their perceptions on teaching staff development needs, administrative staff development needs, curricular needs, and the other needs they may have. Descriptive statistics were used to report the data designed to identify the needs of the eight school divisions in this geographic area.

The census survey method was used to collect data from the eight school divisions served by the IALR returned data from 100% of the superintendents and directors of instruction, 70.4% of principals, and 6.4% of teachers within these school divisions. The low response rate for teachers made the value of their perceptions problematic. The findings of the study indicate an overall perceived need for staff development in the areas of special education, science, math, reading, At-Risk programs, and technology. Further, all respondents indicated a desire for greater access to graduate programs, and a majority of participants expressed a desire to have greater communication with the research center in their area.

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## Chapter One

### Introduction

Technology transfer from the university to industry can be characterized as the relationship between these two institutions of education and economic power that allows for the bidirectional flow of knowledge and efforts for the purposes of economic progress (Dill, 1995; Santoro & Gopalakrishnan, 2001). These relationships can be traced back over a century. For example, the Massachusetts Institute of Technology (MIT) is reported to be the first university to have ties with industry for support of its electrical engineering course. Later in 1908 a chemistry research unit was created to contract with industry. Soon MIT established its Division of Industrial Cooperation and Research. This unit administered the industrial contracts which resulted in research by the university for industrial purposes.

The University of Michigan's Department of Engineering Research operated on the same "fee-for-service" arrangement with industry as MIT (Geiger, 1988). Both Michigan and MIT conducted over a quarter of a million dollars worth of research for industry in 1930 (Geiger, 1988). Another notable alliance between industry and a university was The California Institute of Technology's high tension laboratory funded by the Southern California Edison Company. This arrangement allowed research to be performed by the university for the purposes of furthering its research and to perform research on transmitting electricity over large distances which in turn would benefit the Southern California Edison Company (Geiger, 1988).

The post-1980 era of university-industry technology transfer rests on two pillars. These are the federal government's establishment of National Science Foundation (NSF) Engineering Research Centers (ERC) and the passage of the Bayh-Dole Act (Geiger, 1988). Both of these

acts of legislation illustrate the commitment of the federal government to improving the financial relationship between the university and industry.

The NSF established ERCs in an effort to provide American Industries a competitive advantage in the world industrial markets (Bozeman & Boardman, 2004). ERCs were initially created in 1984 with two main goals and three recommended common characteristics. The goals were (a) to improve the research and training engineers received with more of an industrial focus such that (b) graduates could compete on a global scale. The common characteristics include (a) ERCs should actively foster interaction between the university and industry for the purposes of technology transfer, (b) ERCs should foster an interdisciplinary approach to research that brings together the relevant knowledge needed to solve industrial problems, and (c) ERCs must provide the education needed to accomplish the above mentioned goals (Bozeman & Boardman, 2004). The NSF classified all ERCs into one of four research areas: “bio-engineering manufacturing and processing, earthquake engineering, microelectronic systems and information technology, and manufacturing and technology” (Bozeman & Boardman, 2004, p. 367).

A total of 56 ERCs have been jointly funded at American Universities with the financial backing of the NSF. NSF funding typically accounts for 30% of the annual budget for each ERC. The remainder is provided by the university and industry (Powers, 2003). ERCs are expected to become a self sustaining technology transfer unit between the university and industry. Eventually NSF funding is withdrawn. Currently there is nearly an 80% survival rate for these centers (Bozeman & Boardman, 2004).

The 1980 passage of the Bayh-Dole Act allowed universities and industry to own inventions created from federal funding (§200). The act is considered by many to be one of the most important pieces of legislation for stimulating the growth of technology transfer between

industry and the university (Mowery & Sampat, 2005). Prior to the Bayh-Dole Act the federal government retained patent rights to creations brought about by federal funding and made these creations available through a non-exclusive process. Consequently, industries were hesitant to partner with universities for the development of products to which they would not own exclusive rights (Council on Governmental Relations, 1999). The success of the Bayh-Dole Act is seen in the numbers of university owned patents since its passage. The number of university held patents produced in the pre-Bayh-Dole years averaged 250 per year while the number of university held patents produced in the post-Bayh-Dole years approaches 5,000 per year (Anderson, 2001). Agreements between universities and industries as to the ownership and financial distribution resulting from patents created from technology transfer activities can result in strong ties between the university and industry.

An understanding of research centers is important to educational leaders of K-12 schools for three reasons. The first reason is the potential impact a research center has for the economic development of a locality or its region (Geiger, 1988; Plosila, 2004). This potential impact on economic development has a direct relationship on the locality's ability to pay for education (Alexander & Salmon, 1995). Technology transfer activities such as research centers "have had lasting impacts on state economic development" (Plosila, 2004, p. 113).

The second reason is the capacity of research centers to train new employees for local industrial needs (Santoro & Chakrabarti, 2002). The capacity to train skilled employees from the local population allows for the continued economic development of the area as well as the growth in human capital of the area. Graduates from high schools in proximity to research centers may one day have access to either jobs in the local industries created by these technology transfer partnerships or with additional education, in the research centers themselves.

The potential influence a research center could have on a school division is the third reason K-12 educational leaders would find an understanding of research centers important. Research centers have access to highly trained staff and resources that may be unavailable to K – 12 schools. These staff and resources may be a means by which K-12 educational leaders may increase not only the human capital of its current staff but may also refine its curriculum to more closely align to the needs of the geographic boundaries of the school division given the relationships established between a research center and industries within these boundaries.

### Research Questions

The staff development and school improvement needs of educators in an economically challenged area was the major focus of this study, however, other needs of the local school division were also investigated.. This study was guided by the following research question and subordinate questions. What are the perceived needs of K – 12 educators in the service region of the Institute of Advanced Learning and Research (IALR) located in Southside Virginia?

#### *Subordinate Questions*

1. What are the staff development needs of K-12 teachers in the service region of the IALR in Southside Virginia?
2. What are the staff development needs of K-12 administrators in the service region of the IALR in Southside Virginia?
3. What are the curricular needs of K – 12 educators in the service region of the IALR in Southside Virginia?
4. What are other needs of school divisions in the service region of the IALR in Southside Virginia?

### Purposes of the IALR

The Institute for Advanced Learning and Research (IALR) is located in the south central region of Virginia known as Southside. The IALR was established in 2002 by the Code of Virginia for the purposes of :

1. Seek to diversify the Dan River Region's economy by engaging the resources of Virginia Polytechnic Institute and State University in partnership with Danville Community College and Averett University and public and private bodies and organizations of the region and state.
2. Serve as a catalyst for economic and community transformation by leveraging and brokering resources that support economic diversity for the region, particularly within the network economy.
3. Provide a site for the development of the technology and trained workforce necessary for new economic enterprises to flourish in Southside Virginia through the teaching, research, outreach, and technology available from its partner institutions.
4. Expand access to higher education in Southside Virginia by providing for adult and continuing education, workforce training and development, and degree-granting programs, including undergraduate, graduate and professional programs, through partnerships with the Commonwealth's private and public institutions of higher education, the City of Danville, County of Pittsylvania, the public schools, and the public and private sectors in the region.

5. Serve as a resource and hub for network-related initiatives in education, at all levels, and in economic development activities.
6. Assist in regional economic and community development efforts by housing and encouraging research and product-related activities and encouraging high technology economic development in the region.
7. Encourage and coordinate, as appropriate, the development and delivery of programs offered by those educational institutions serving the region.
8. Serve as a resource and referral center by maintaining and disseminating information on existing educational programs, research, and university outreach resources (Code of Virginia Chapter 23 §231.19).

#### Significance of the Study

This study adds to the body of knowledge in education regarding the needs Southside Virginia K-12 schools have of a specific research center, the IALR. The influence research centers have over public K-12 schools is an area of needed research given the increasing numbers of research centers. Information from this study will assist school systems in Southside Virginia by identifying their needs which can then be assessed by the IALR or other educational entities. This study is also of significance to the IALR since assisting public schools is one of its responsibilities as established by the Code of Virginia. Establishing the needs of public schools in Southside Virginia will permit the IALR and other educational organizations to determine if they can assist in meeting those needs.

## Definitions

The literature defines university technology transfer as “formal efforts to capitalize upon university research by bringing research outcomes to fruition as commercial ventures” (Dill, 1995, p. 370). Santoro and Gopalakrishnan (2001) embrace a broader definition of technology transfer as including activities used to share knowledge needed for advancement of technology between the university and industry (2001). Dill explained the one category of *formal efforts* pertinent to this study, research centers. Research centers are “units responsible for stimulating research and technology transfer in a particular area of technology, usually under joint university-industry support” (p. 371).

The IALR meets the above stated definition of a research center. The IALR’s previously stated purposes are calculated to stimulate research relative to the needs of Southside Virginia’s industries and its university partners. This study embraced these definitions as it explored its research question as previously stated. An understanding of how these formalized efforts of research centers affect the economic development of an area is essential for educational leaders who wish to capitalize upon these relationships.

The service region of the IALR may be defined as those school divisions served by the IALR. According to the Director of Outreach and New Economy Program Development for the IALR, these school divisions include: Danville City Schools, Pittsylvania County Schools, Martinsville City Schools, Henry County Schools, Patrick County Schools, Halifax County Schools, Mecklenburg County Schools, and Franklin County Schools (L. Nilsen, personal communication, June 15, 2006).

The survey instruments use of the term at-risk refers to the following definition:

a school-aged individual who is at risk of academic failure, has a drug or alcohol problem, is pregnant or is a parent, has come into contact with the juvenile justice system in the past, is at least one year behind the expected grade level for the age of the individual, has limited English proficiency, is a gang member, has dropped out to school in the past, or has a high absenteeism rate at school (“Glossary of Terms, n.d. p.1).

### Limitations

The data analysis used in this study was drawn from information obtained from a single research center and from school divisions served by the center. The school divisions and geographic region from which the data were gathered may not be representative of other school districts or other regions within the United States. This nonrepresentative sample will limit the generalizability of this study. Therefore no attempt at extending the findings was attempted.

Although, as previously stated, the IALR was established relative to eight purposes, the fourth purpose of expanding access to higher education by partnering with public schools appeared to be the most germane to the given research question. The other purposes were relevant to this research question but perhaps to a lesser degree.

### Institute for Advanced Learning and Research

The establishment of the IALR is one of the suggestions from a 2000 report prepared for the Future of the Piedmont Foundation which was concerned with the economic revitalization of Southside (“Learning, Working,” 2000). This report led to the eventual establishment of the IALR in 2002. by the Commonwealth of Virginia (Code of Virginia Chapter 23 §231.19) The IALR is designed to be a “catalyst for economic and community transformation (“What is the”, n.d., p. 1)” of the economically distressed area of Southside. The IALR plans to transform Southside through a five pronged attack. The individual units of IALR’s transformational

strategy are: strategic research, advanced learning programs, advanced networking and technology, commercial opportunity development, and community outreach ("IALR Mission", n.d., p. 1)"

“By capitalizing on abundant regional assets, the research centers at the IALR will transform Southside Virginia’s economic and intellectual climate and serve as magnets to attract talent, technology, entrepreneurs, and national interest”("Research", n.d., p. 1). The research centers located at the IALR take advantage of the textile, auto racing, and agricultural heritage of the region. The research centers include The Advanced and Applied Polymer Processing Institute, The Virginia Institute for Performance Engineering and Research, The Joint Unmanned Systems Testing, Experimentation, and Research Site, and the Institute for Sustainable and Renewable Resources ("Research", n.d.).

The second method by which the IALR hopes to transform Southside is by offering advanced courses of study and growing human capital of the area.

The Institute for Advanced Learning and Research is committed to providing high quality accredited academic programs to meet the future and current needs of Southside Virginia. Under development are a breadth of undergraduate and graduate degrees and certificate programs, as well as the promotion of a seamless pathway between associate’s, bachelor’s, and graduate programs ("Academics", n.d., p. 1).

The IALR has partnered with local institutions of higher learning, Danville Community College and Averett University, to offer these advanced degrees. The focus of these degrees include “preparing a workforce for the future, meeting current employer needs, and expanding access to higher education opportunities" ("Academics", n.d., p. 1).

The IALR hopes to transform Southside Virginia from a region dependent upon manufacturing and tobacco to a region leading the state in information technologies. The IALR envisions information technology as one of the cornerstones to the economic revitalization of Southside.

To this end, IALR is focused on:

- Researching and facilitating the installation of leading edge technologies, both within the IALR and its affiliated facilities as well as in partnership with regional entities engaged in implementing advanced networking infrastructures
- Staying abreast of cutting-edge applications of information technology, and positioning the IALR in a leadership role regionally in the adoption and utilization of these applications
- Championing the adoption of business, government, healthcare, education, and entertainment applications that will drive broadband demand in the region. Advocating the first mile broadband connectivity for businesses and organizations in the region
- Educating the Southside region about leading edge technologies, advanced networking, and cutting edge applications of information technology that position the organizations in this region to be players in the innovation, networked economy
- Promoting Southside Virginia as a place that is progressive, that understands and is adopting durable information technology platforms, and that effectively uses information technology to create competitive advantage ("Technology", n.d., p. 1).

The IALR hopes to provide for commercial opportunity for the economic development of Southside through the “commercialization of technologies developed through IALR research

centers” (“COMMERCIAL ACTIVITIES”, n.d., p. 1) and by attracting business leaders to its conference center. The conference center located at the IALR provides 20,000 square feet of space with access to a 8,400 square foot Great Hall, a 135 seat executive auditorium, plasma screen televisions located in all board rooms; 21 screens throughout the complex, 3-way video conferencing capabilities, award-winning culinary service, and unsurpassable bandwidth (“About the ICC”, n.d.).

Community outreach is the final element of the IALR’s transformational strategy for Southside. There are four components to IALR’s community outreach program: learning programs for adults and educators, learning programs for K-12 students, public computing facilities at the IALR, and Southside Community Advocates for Learning Excellence-United for Progress, SCALE-UP (“OUTREACH”, n.d.).

Adult programs include learning lift off, a program designed to improve mathematics skills of children and adults, and community training on e-commerce. Programs designed for educators include faculty development in the areas of technology, math, and science. Programs for K-12 students include learning lift off, refurbishing computers, and summer enrichment programs focusing on science, math, and technology. The SCALE-UP program is a community based group committed to altering the regions economy by focusing on the education and life-long learning of Southside’s citizens (“OUTREACH”, n.d.).

## Chapter Two

### Theory

Powers acknowledges that presently there is not a theory of university technology transfer (2003). As a result, the literature is silent as to a theory of the various technology transfer units, in particular research centers. However, an examination of the reasons universities and industries enter such an arrangement leads to the inclusion of two developed theories. First, Powers used the resource-based view of the firm theory to explain why industries seek alliances with universities through the use of research centers (2003). He explained resources of an industry that are difficult to reproduce, i.e. knowledge and highly trained personnel, provide a firm a competitive advantage. Secondly, using the resource-dependence theory, Powers was able to suggest reasons why universities would seek alliances with industry in the form of research centers (2003). The resource-dependence theory states organizations, i.e. universities, will seek ways to reduce their dependence on suppliers of resources, i.e. state funding. Powers argues that reduction in university funding has necessitated the need for universities to seek out partnerships with industry in the form of research centers (2003).

The literature confirms Powers' position. This symbiotic relationship between these two institutions of knowledge and economic power affords both the opportunity to benefit. Industries gain knowledge by accessing the talents and educational experiences of students and staff. Industries also gain prestige from their association with universities. Universities on the other hand gain access to funds and an opportunity to expose both staff and students to practical problems as well as employment opportunities (Geisler, 2001; Santoro & Chakrabarti, 1999). Educational leaders may use an understanding of university-industry research center

relationships to assist in the development of these relationships which may ultimately improve the economic landscape of their locality.

### Presentation of Studies

The studies chosen for inclusion in this literature examine the nature of research centers from the perspective of both industry (Dill, 1995; Santoro & Chakrabarti, 2002; Santoro & Gopalakrishnan, 2001) and that of the university (Jackson & Audretsch, 2004; Rogers, et al., 1999). Furthermore, the studies chosen are presented in a sequence that will first paint the broad picture of technology transfer and research centers then will focus on research centers at a specific university and will ultimately focus on a specific research center. This increasingly focused presentation of research centers as modes of technology transfer will enable the reader to gain an understanding of the nature of these technology transfer units.

#### *Study One*

The first of three studies conducted examining research centers from the perspective of industry is that of Santoro & Chakrabarti (2002). The focus of this study was how four types of relationships between research centers and industry were related to variables associated with specific firms. The authors listed these four relationships in an increasingly interactive sequence: (a) *Research support* creates the least interaction between the university research center and industry. This function merely allows for the flow of capital from industry to the research center. The purpose of research support upholds the resource-dependence theory previously discussed. (b) *Cooperative research* generally “include[s] contract research with individual investigators, consulting by faculty, and certain group arrangements specifically for addressing immediate industry problems” (Santoro & Chakrabarti, 2002, p. 1164). This is reminiscent of MIT’s “fee-for-service” arrangement with industry. (c) *Knowledge transfer* is “a much broader array of

highly interactive activities that include on going formal and informal personal interactions, cooperative education, curriculum development and personnel exchanges” (Santoro & Chakrabarti, 2002, p. 1165). A chief mechanism for knowledge transfer from the university research center to industry is the “recruitment of recent university graduates and employing student interns” (Santoro & Chakrabarti, 2002, p. 1165). Finally, (d) *technology transfer* relationships focus on urgent and explicit industry issues resulting in commercial applications. Technology transfer relationships often result in joint business ventures. The purposes of knowledge transfer and technology transfer supports Powers (2003) use of the resource dependence theory as reasons why universities and industry form such relationships. These relationships are also in keeping with the characteristics of ERCs previously discussed.

The authors constructed a survey instrument to correlate these four types of research center relationships discussed above to specific industrial motivational factors for entering into such relationships. Exploratory data for the survey was gathered by examining recent NSF program survey protocols. Semi-structured interviews (15) with representatives from both industry and university provided validity to the authors survey instrument. University research centers ( $N = 29$ ) were contacted by the authors for participation in the study. The participation rate among contacted centers was 72%. Participating research centers were funded by either the NSF (76%) or other sources (24%). The greater representation of NSF funded centers may be a source of bias and may limit the generalizability of the study. While the authors noted the diverse industrial representation of the 21 participating centers adds to the generalizability of the results. Surveys were mailed to all 421 industrial firms associated with the 21 centers in this study resulting in a 48% response rate. The article was silent as to methods used to increase this rate. However, an unspecified analysis was conducted to determine response bias. There were no significant

differences reported between those responding and those not responding. Structured interviews were conducted with 31 firms in various industrial sectors to further validate the survey data and gain additional information.

The authors used 19 items of their instrument, each with a seven point Likert-type scale, in which these four variables emerged: knowledge transfer ( $\alpha = .91$ ), technology transfer ( $\alpha = .92$ ), cooperative research ( $\alpha = .88$ ), and research support ( $\alpha = .92$ ). These four types of relationships were treated as dependent variables by the authors. The authors used a VARIMAX rotation to validate these measures.

The remaining items on the author constructed instrument were used to capture data relative to variables associated with industrial motivations for entering into research center relationships with universities. Six variables emerged. These were treated as independent variables. They were: (a) the desire to “strengthen skills, knowledge, and gain access to university facilities for essential, core technologies” (Santoro & Chakrabarti, 2002, p. 1170) (b) the desire to “strengthen skills, knowledge, and gain access to university facilities for ancillary, non-core technologies” (Santoro & Chakrabarti, 2002, p. 1171). The instrument used a four item scale with a seven point Likert-type scale to collect these data ( $\alpha = .93$ ,  $\alpha = .91$ ). (c) The presence of a champion for the research center both at the industrial firm as well as at the research center was determined by the use of a one-item scale with a seven point Likert-type scale. (d) Firm size was measured by the small business administrations classification scheme (e) The organizational structure of the firm was captured by the use of three item scale each with seven point Likert-type scale ( $\alpha = .75$ ). (f) The authors coded a firm’s industrial sector using established codes as specified in the literature. The authors chose to control for this last variable because research centers are typically sector specific.

The authors controlled for multiple responses from the same firm by aggregating the data for each firm into one response per firm. Homogeneity of individuals responsible for aggregated responses was confirmed by a high inter-rater reliability. The need to aggregate data from firms resulted in a final sample size of 189.

The independent and dependent variables listed above were used to evaluate four hypotheses by the use of multiple regression in which a taxonomy of regression models by firm size was employed by the authors. The first hypothesis proposed that large industrial firms support knowledge transfer and research support relationships with university research centers for the purpose of enhancing the firms' non-core technologies ( $p < .001$ ). The second hypothesis proposed that small industrial firms support technology transfer and cooperative research relationships with university research centers for the purpose of enhancing the firms' core technologies ( $p < .001$ ). The third explored hypothesis was that the presence of a research center champion at the firm results in a higher concentration of all four types of research center relationships than the presence of a champion at the research center ( $p < .01$ ). Finally, the fourth hypothesis stated that firms of a more organic nature, as defined by fewer hierarchical levels, are more likely to engage in technology transfer and cooperative research relationships while firms with a more mechanistic nature, as defined by more hierarchical levels, are more likely to engage in knowledge transfer and research support relationships when involved with research centers. Statistical significance was not established for hypothesis four as stated. This lack of statistical significance for hypothesis four may appear surprising given the previously established significance found for hypotheses one and two. The relationship established in hypothesis one suggests that there would be a higher incidence of knowledge transfer and research support between large (mechanistically structured) firms, and university research centers as compared to

small (organically structured) firms. The relationship established by hypothesis two suggested that there would be a higher incidence of technology transfer and cooperative research between small (organically structured) firms and university research centers as compared to large (mechanistically structured) firms.

The findings of this study add to the theoretical framework discussed earlier. Santoro and Chakrabarti support the resource-based view of why industries enter into a research center relationship with universities by identifying four types of relationships between industry and the university and reasons why industry would enter into each of the four. However, their research provides possible predictive power based on the firm's size and presence of a champion as to precisely how a research center could be used to meet a firm's needs. Educational leaders desiring to enhance their locality's economic development may be well advised to consider a firm's size and presence of a champion when considering establishing a research center relationship with industry and the university.

### *Study Two*

The second article presented in this review continues the work of Santoro and Chakrabarti (2002) by offering additional reasons industries enter into research center relationships with universities. Santoro and Gopalakrishnan (2001) extended the data captured by Santoro's previously discussed survey instrument to answer the question "To what extent do the relationship factors of trust, geographic proximity, communication effectiveness, and university policies for IPR [intellectual property rights], patents, and licenses influence technology transfer activities between industrial firms and university research centers?" (Santoro & Gopalakrishnan, 2001, p. 163-164). They used the same data gathering instrument as Santoro & Chakrabarti

(2002) as previously discussed. They then explicated why these four factors facilitate the technology transfer process between firms and research centers.

First, the authors predicted a firm's trust in its relationship with the university research center to be "the cornerstone of developing a stable relationship" (Santoro & Gopalakrishnan, 2001, p. 163). They contended trust of a university research center equated to predictability which in turn increased the technology transfer activities.

Second, Santoro & Gopalakrishnan (2001) explicated the primary reason geographic proximity between the firm and the research center is important for facilitating technology transfer is that this proximity allows for formal and informal interactions between the two. They also acknowledged that the frequency of these formal and informal interactions is facilitated by lower travel costs.

Third, the authors suggested that effective communication between the firm and the research center aides in articulating technology objectives that are clearly understood by both stake holders. These mutually understood objectives then increased the rate of technology transfer and reduced the amount of uncertainty which in turn may increase the trust between both stake holders.

Finally, the authors explored the notion that universities may increase the rate of technology transfer by showing flexibility in IPR, patents, and licensing. This demonstrates the universities desire to partner with industry. Specific examples of this flexibility include: "delaying the publication of research results in academic journals, allowing an industrial firm to receive royalties, and offering first option exclusive licensing rights to a sponsoring industrial firm." (Santoro & Gopalakrishnan, 2001, p. 165-166).

The authors of this article used items specific to technology transfer activities from the previously discussed survey instrument. The five items used to measure technology transfer in this instrument had a high reliability ( $\alpha = .92$ ) in which a VARIMAX rotation was used to calculate factor loadings. Again, technology transfer activities were treated as the dependent variable while trust ( $\alpha = .70$ ), geographic proximity, communication effectiveness, university policies for IPR, patents, and licenses, and the firm's organizational structure ( $\alpha = .75$ ), and organization size were used as independent variables. An apparent weakness of this study is the lack of reliability data for four of the independent variables. This may limit the results of the study by threatening its internal validity. The authors chose to control for organizational structure and size. Prior research in the field as well as Santoro and Chakrabarti's (2002) previous study indicate that firm size and structure play important roles in technology transfer activities. The authors note a strong correlation between several of the independent variables yet are silent as to an analysis of multi-collinearity between these variables. This may limit the study by threatening its internal validity.

The dependent and independent variables of this study were used to create and test four hypotheses by the use of multiple regressions. Statistical significance ( $p < .01$ ) was found to exist between a firm's level of trust in a research center and the extent of technology transfer activities. A greater level of statistical significance ( $p < .001$ ) was found to exist between a firm's geographic proximity to a research center and a university's flexibility in IPR activities as they pertain to technology transfer activities. Surprisingly, there was a lack of significance between communication effectiveness and technology transfer activities. The authors note communication effectiveness may also be measured by the variables of trust and geographic proximity. This would explain the lack of significance and suggests avenues for further research. Standardizing

the coefficients enabled the authors to note that flexible university IPR policies appear to be the most important factor in increasing technology transfer activities between university research centers and industrial firms. The authors further note the temporal nature of trust and its propensity to change.

The work of Santoro and Gopalakrishnan (2001) extended the work previously done by Santoro and Chakrabarti (2002) by examining the relationship oriented factors of trust, geographic proximity, communication effectiveness, and university IPR policies associated with a single type of industry-university interaction, technology transfer. This work also adds to the previously discussed resource-based theoretical framework by suggesting reasons why industries would enter into research center relationships with universities. Specifically, their work suggests the need for educational leaders to understand the importance of proximity, IPR, and trust in establishing research center relationships with industry.

### *Study Three*

Dill (1995) focused on the incidence rates and characteristics of organization and management common to all five types of university technology transfer units previously discussed and their effect on technology transfer performance. Dill's article is important because it attempts to establish correlations between the research center's management and technology transfer performance. Although the actual incidence rate of research centers was in keeping with the expected rate. The expected to actual ratios of other technology transfer units varied by the type of university (research, doctoral granting or medical and engineering) (Dill, 1995). However, these other types of technology transfer units are not the focus of this review and the unexpected incidence rates of these units will not be discussed. Dill (1995) used a stratified random sample of American universities which "grant the doctorate and specialized institutions

engaged in engineering and health-related work” (p. 371) because these types of institutions are responsible for “the vast majority of federally and privately sponsored research conducted in American academic institutions” (p. 371). The sample of 115 institutions represented 39.7% of the specified population. The author noted that the high response rate within each institution type caused the sample to be reflective of the population. These institutions participated (78%) in a telephone interview. The article was silent as to methods used to increase this response rate.

The heads of the technology transfer units, as reported by the telephone interviews, were mailed questionnaires. The purpose of the questionnaire was to validate suggestions found in the literature concerning the effect organization and management of technology transfer units have on performance. The author’s failure to include data relative to a response rate to this questionnaire may jeopardize the generalizability of this study. Although the author notes the results of this survey were common to all five units of technology transfer, unfortunately only five of the 79 (6%) units responding were research centers.

The questionnaire was used to examine the influence three factors have on overall technology transfer performance. These factors were individual, managerial, and organizational. Individual factors of the technology transfer unit manager collected included “birth date, terminal degree, field of study, and years of experience in both the relevant field and in the university setting” (Dill, 1995, p. 375). The professional orientation was measured by two Likert scale items. These items measured the orientation of the manager to “advancement as a manager, or to professional development as a scientist” (Dill, 1995, p. 375). These items were developed from previously published research. The lack of validity data on all of the measures used in the questionnaire may have threatened the internal validity of the study. Again, this may limit the usefulness of the results. Managerial factors included time spent on managerial tasks, number of

people supervised, and communication activities. A Likert scale was used on four items to capture data relative to the communication frequency at the university, local community, and national levels. Again, no validity data were available. All three of these factors were treated as independent variables. Organizational factors included in the questionnaire were “year of founding for the unit, the number of professionals, the number of support staff, and the most recent annual budget” (Dill, 1995, p. 375).

The author acknowledged the difficulty in accurately measuring outputs of technology transfer. He also pointed out the weakness in failing to include measures of performance relative to technology transfer. Nonetheless, the author used an unspecified self rating scale to measure the individual units’ technology transfer performance. The self-rating scale may be a source of bias for these results.

The following variables were shown to be correlated with perceived technology transfer performance: manager’s years of experience in the field ( $p < .01$ ), orientation of the manager to professional development as a scientist ( $p < .01$ ), frequency of communication within the unit ( $p < .001$ ), with the university ( $p < .01$ ), with the local community ( $p < .001$ ), and at the national level ( $p < .05$ ).

The only correlations of statistical significance to perceived technology transfer performance were managerial factors, primarily communication. This study suggested a research center’s technology transfer performance is linked to the center’s director or manager. Specifically, the study suggested that the director benefits from having experience in the field of study as a scientist and from communicating frequently with all levels involved with the research center. Educational leaders may benefit from this understanding when selecting a research center’s director.

### *Study Four*

The purpose of the study by Rogers et. al. (1999) was to answer six research questions pertaining to the nature of all of the research centers located at the University of New Mexico (UNM). The questions were:

1. What is the nature of the typical research center at the University of New Mexico?
2. Why have the number of research centers and their total funding, been increasing rapidly at the University of New Mexico during the 1990's?
3. Why are research centers founded?
4. What is the role of the director in creating and maintaining a research center?
5. How do university-based research centers transfer technology to private companies and to other organizations?
6. What determines the effectiveness of research centers in reaching their objectives?

(Rogers, et al., 1999, p. 668)

This study is important because of its holistic approach to examining research centers at a single university. Educational leaders desiring to establish research centers in proximity to a similar university may find these results especially salient. The authors used personal interviews with the directors of all 55 research centers located at this university as their source of primary data.

Other data collected by the authors included the research centers' annual reports and unspecified "other written materials" (Rogers, et al., 1999, p. 692). A noted weakness of this study is the lack of reliability data pertaining to the survey instrument used. This lack of reliability data may have jeopardized the internal validity of the study which in conjunction with limiting the sample to one university may ultimately limit the generalizability of the study. The data relative to answering the first five questions were presented in descriptive formats only. Data relative to the

last question was presented with a statistical analysis that included information relative to its validity. The authors were silent as to how the validity of their data for the first five questions was achieved.

Data collected revealed the answer to the research question, “What is the nature of the typical research center at the University of New Mexico?” (Rogers, et al., 1999, p. 688). The average center had a \$2.7 million annual budget, had 33 employees representing four departments, and has a full time director employed as a faculty member (Rogers, et al., 1999). The authors noted the high degree of variability among the 55 research centers studied and cautioned the reader in using these data to describe a typical center at UNM.

The survey instrument used answered the question, “Why have the number of research centers, and their total funding been increasing rapidly at the University of New Mexico during the 1990’s?” (Rogers, et al., 1999, p. 688). The authors noted two unique reasons for the growth in research centers at UNM. The first is the geographic proximity to three very large federal research and development laboratories. These laboratories, Los Alamos National Laboratory, Sandia National Laboratory, and the U.S. Air Force Phillips Laboratory, accounted for 59% of the funding for research centers located at UNM. Santoro and Gopalakrishnan (2001) support geographic proximity as a reason for higher incidences of technology transfer by research centers. The other unique reason for the rise in research centers was the presence of a champion at the university who “strongly encouraged the founding of university-based research centers as a means of increasing the university’s total research funding and hence its academic status as a research university” (Rogers, et al., 1999, p. 696). This champion also strongly encouraged multiple university departments to work together to establish various research centers. The importance of a champion at the university failed to parallel the work of Santoro and Chakrabarti

(2002) who noted the importance of a champion at the industrial firm for technology transfer activities. This apparent disagreement may be explained by the employment status of survey respondents relative to either the university or industry.

The survey instrument revealed that most research centers, 58%, “were founded by an entrepreneurial faculty member due to the availability of research funding from an external source” (Rogers, et al., 1999, p. 697). While 43% were started by faculty members that either desired to conduct a multidisciplinary study or desired a greater level of autonomy from their respective academic departments. This reason for starting research centers adds credibility to the previously mentioned theoretical framework for why universities begin research center relationships with industry.

The role of the director in creating and maintaining research centers was next explored. The authors note three roles for the director: “(1) to motivate his or her research staff in collaborative research activities, (2) to obtain funding, and (3) to conduct funded research.” (Rogers, et al., 1999, p. 698). The authors noted the difficulty some directors mentioned in communicating with representatives from various departments within their research centers. The discipline specific languages were obstacles to overcome in establishing effective communication among all staff members. Dill (1995) supports the importance of the director as a scientist. Interestingly, Dill (1995) also reports on the importance of communication within the research center which is a noted difficulty in the present article.

The authors then explored how technology was transferred from the university research center to private companies and other organizations. This question captures not only the potential economic impact a research center may have to an area, but also points to the two most interactive types of industry-university relationships previously discussed by Santoro &

Chakrabarti (2002), knowledge transfer and technology transfer. At least 70%, of the research centers reported the publication of research as a means of transferring technology. Other means of reported technology transfer included the incorporation of technological innovations into university courses (38%), industrial partners hiring graduate students or other research center staff (35%), attending meetings and conferences (33%), creation of new (spin-off) companies based on the technology relative to a research center (18%), and technology licensing activities (16%). The authors noted the potential impact of the lesser used modes on technology transfer activities. An examination of this research question by using the work of Santoro and Chakabarti (2002) reveals the relationships UNM research centers have with their respective partners are highly interactive and expected due to the high degree of federal funding.

To answer the question “What determines the effectiveness of research centers in reaching their objectives?” (Rogers, et al., 1999, p. 688), the authors first defined effectiveness as “the degree to which an organization fulfils its objectives” (Rogers, et al., 1999, p. 692). The interviews revealed the objectives of each research center and ultimately revealed eight dimensions of effectiveness. These were:

(1)technology transfer, (2) training and placing former graduate students (and staff) in outside employment, (3) total budget, (4) research productivity, measured in number of publications, (5) staff size, (6) length of existence (in years), (7) the director’s role, and (8) the number of departments represented in each research center (Rogers, et al., 1999, p. 692-694)

These measures of effectiveness may lead educational leaders to a greater understanding of the nature of research centers. Reliability of these dimensions was achieved by intercorrelating the ratings among the six authors. All dimensions other than length of existence revealed a

significant correlation with effectiveness. The number of departments involved in a research center was correlated at the  $p < .01$  level while the remaining six were correlated to effectiveness at the  $p < .001$  level. An examination of the more effective research centers revealed they were typically larger in both staff and budget and involved more academic departments. Previous authors discussed also found correlations between many of these factors and technology transfer effectiveness. However, Dill (1995) did not find significance in the size of staff.

#### *Study Five*

The historical events previously mentioned as catalysts for the establishment of research centers helps build the framework for the creation of a specific research center, the Indiana University Advanced Research and Technology Institute (ARTI) (Jackson & Audretsch, 2004). This study is important because it demonstrates the evolving nature of a specific research center as a mode of technology transfer. Educational leaders desiring to pursue this type of relationship with industry may benefit from an understanding of the dynamic nature of this research center. Jackson and Audretsch (2004) used multiple sources of data including interviews with key participants and documents pertinent to ARTI to present a case study that examined the establishment of ARTI and its developing nature as well as measures of its performance.

Triangulation of the data revealed Indiana University could trace its roots of technology transfer to 1936 with the creation of the Indiana University Foundation. However, technology transfer activities were described as “serendipitous and less focused” (Jackson & Audretsch, 2004, p. 120) until 1991 saw the creation of the Office of Technology Transfer and the creation of ARTI in 1996. ARTI was initially organized with the broad purpose “to operate a research institute...administer the progress of research parks and technological innovations promoting

scientific, educational and economic development opportunities, and as a means to manage technology transfer and intellectual property” (Jackson & Audretsch, 2004, p. 120).

The purpose of ARTI evolved to include only licensing and trademarks in 1998. This shift allowed for more direct involvement in the Central Indiana Life Science Initiative and the Emerging Technology Center. Both have a life and health sciences focus and are now used to evaluate the center’s performance as noted below (Jackson & Audretsch, 2004). Although the authors attempted to establish credibility in this study by triangulation, they were silent as to other measures employed for this purpose. The researchers of this study acknowledged their employment by Indiana University. This may jeopardize both the study’s confirmability and authenticity due to possible biases of the researchers. The authors were silent as to the length of this study. This lack of rich, thick descriptions may also jeopardize this study’s transferability.

The authors evaluated ARTI’s performance based on their success in meeting its mission of “enhance[ing] Indiana’s business competitiveness through technology innovation” (Jackson & Audretsch, 2004, p. 121). The two performance indicators used were revenue metrics and throughput metrics. Revenue metrics were defined as licensing income while throughput metrics were defined as licenses, invention disclosures, and patents per year (Jackson & Audretsch, 2004). When evaluated from these two metrics, ARTI was shown to be a success. As compared to 1998 figures both income and licenses increased nearly 100% in 2002 while invention disclosures increased 42% from 2001 to 2002 (Jackson & Audretsch, 2004).

The authors note four reasons a university might enter into a research center arrangement. They are: “(1) providing additional revenues, (2) enhancing university recognition and visibility, (3) provide, attract, and retain talented faculty and graduate students, and (4) more directly affect the employment landscape” (Jackson & Audretsch, 2004, p. 122). They further note the

difficulty in evaluating metrics relative to the last two reasons for entering such a relationship. They suggest further research is needed to properly identify metrics which can measure these two areas. Perhaps further research into affecting the employment landscape would be of the greatest importance to educational leaders looking to the establishment of research centers as vehicle for positively impacting an area's economic development.

### Conclusion

The literature reviewed examined the dynamic relationships that exist between industry and the university for the purpose of establishing and maintaining research centers. Both industry and the university enter into such relationships for differing reasons that are in keeping with the resource-based and resource-dependence theories previously discussed. An understanding of these reasons from both the industry and the university perspectives is crucial in understanding the nature of these centers.

## Chapter Three

### Methodology

One of the stated purposes of the IALR is to provide access to higher education by partnering with public schools. Assessing the perceived needs of K-12 educators in the school divisions contained in the service region of the IALR was the purpose of this study. Adequately assessing these perceived needs required (1) identifying the school divisions of the IALR's services area, (2) defining the population of each school division of the service area relative to administrative and teaching staff, (3) identifying the data needs of this study, (4) development of instruments designed to gather the required data, (5) describing the method by which the data were gathered, (6) finally, describing the methods by which the gathered data were analysed.

According to the Director of Outreach and New Economy Program Development for the IALR, the school divisions served by the IALR include: Danville City Schools, Pittsylvania County Schools, Martinsville City Schools, Henry County Schools, Patrick County Schools, Halifax County Schools, Mecklenburg County Schools, and Franklin County Schools (L. Nilsen, personal communication, June 15, 2006). The IALR also partners with several private schools within these areas. However, since private schools are not the focus of this study, no other mention will be made of them. Locating the IALR in the Danville/Pittsylvania community can be attributed to the work of the Future of the Piedmont Foundation. The report prepared for this foundation, *Learning. Working. Winning.*, called for the establishment of the IALR at its present location for the purposes of revitalizing the economy of the area ("Learning, et al., 2000).

### Population

Adequately describing each school division of the IALR's service area relative to the purpose of this study limited the defining characteristics to the number of instructional staff and

school administrators in each of the eight school divisions. According to the Virginia Department of Education, Patrick County Schools has the smallest administrative staff and the smallest teaching staff of any school division within the population of this study while Pittsylvania County has the largest staff ("Publications", 2006). According to the 2004-2005 data used by the Virginia Department of Education, Patrick County Schools funds six principal positions and 123 instructional positions at the elementary level and four principals and assistant principal positions and 83 instructional positions at the secondary level. Patrick County Schools has six elementary schools and one high school ("Virginia Educational Directory", n.d.).

The next smallest school division relative to instructional and administrative staff served by the IALR is Martinsville City Schools ("Publications", 2006). According to the Virginia Department of Education's 2004-2005 data, Martinsville City Schools funds five and a half principals and assistant principal positions and 147 instructional positions at the elementary level and five principals and assistant principal positions and 102 instructional positions at the secondary level. Martinsville City Schools has three elementary, one middle, two early childhood, and one high school ("Virginia Educational Directory", n.d.).

Mecklenburg County Schools is the third smallest school division within the service area of the IALR as measured by instructional and administrative staff ("Publications", 2006). According to the Virginia Department of Education's 2004-2005 data, Mecklenburg County Schools funds 13 principals and assistant principal positions at the elementary level while funding 250 elementary instructional positions. The secondary level is funded at seven principals and assistant principal positions and 176 instructional positions. Mecklenburg County Schools has six elementary, two middle, one alternative, and two high schools ("Virginia Educational Directory", n.d.).

Halifax County Schools is the fourth smallest school division within the service area of the IALR as measured by instructional and administrative staff ("Publications", 2006).

According to the Virginia Department of Education's 2004-2005 data, Halifax County Schools funds 12 principal positions at the elementary level while funding 317 instructional positions at this level. These data also reveals Halifax County Schools funds nine principal and assistant principal positions at the secondary level while funding 259 secondary instructional positions. Halifax County Schools has 12 elementary, one middle, and one high school. ("Virginia Educational Directory", n.d.).

Franklin County Schools is the fourth largest school division within the service area of the IALR as measured by instructional and administrative staff ("Publications", 2006).

According to the Virginia Department of Education's 2004-2005 data, Franklin County Schools funds 16.5 principal and assistant principal positions at the elementary level while funding 354 instructional positions at this level. These data also reveal Franklin County Schools funds 13 principal and assistant principal positions at the secondary level while funding 221 secondary instructional positions. Franklin County Schools has 12 elementary, one middle, one high, and one speciality schools ("Virginia Educational Directory", n.d.).

Danville City Schools is the third largest school division within the service area of the IALR as measured by instructional and administrative staff ("Publications", 2006). According to the Virginia Department of Education's 2004-2005 data, Danville City Schools funds 15 principal and assistant principal positions at the elementary level while funding 367 instructional positions at this level. These data also reveal Danville Schools funds nine principal and assistant principal positions at the secondary level while funding 234 secondary instructional positions. Danville City Schools has ten elementary, three middle, two high, one alternative, and one

preschool ("Virginia Educational Directory", n.d.). A returned letter to the preschool indicated that the preschool had moved without a forwarding address.

Henry County Schools is the second largest school division within the service area of the IALR as measured by instructional and administrative staff ("Publications", 2006). According to the Virginia Department of Education's 2004-2005 data, Henry County Schools funds 16 principal and assistant principal positions at the elementary level while funding 380 instructional positions at this level. These data also reveal Henry County Schools fund 12 principal and assistant principal positions at the secondary level while funding 281 secondary instructional positions. Henry County Schools has 11 elementary, two middle, and two high, schools ("Virginia Educational Directory", n.d.).

Pittsylvania County Schools is the largest school division within the service area of the IALR as measured by instructional and administrative staff ("Publications", 2006). According to the Virginia Department of Education's 2004-2005 data, Pittsylvania County Schools funds 26 principal and assistant principal positions at the elementary level while funding 528 instructional positions at this level. These data also reveal Pittsylvania County Schools funds 14 principal and assistant principal positions at the secondary level while funding 272 secondary instructional positions. Pittsylvania County Schools has ten elementary, four middle, four high, one alternative, and one career and technical schools ("Virginia Educational Directory", n.d.).

School divisions within the service area of the IALR are served by three governor's schools. The Piedmont Governor's School for Mathematics, Science, and Technology serves five of these school divisions. It serves Patrick County Schools, Henry County Schools, and Martinsville City Schools at the Patrick Henry Community College campus located in Henry County. It serves Danville City Schools and Pittsylvania County Schools at its location in the

IALR. There are a total of 10 faculty members serving at these two sites and one administrator overseeing both sites ("Piedmont Governor's", n.d.). The Governor's School of Southside Virginia serves Halifax County Schools and Mecklenburg County Schools. These two divisions are served at the Southside Community College. Other school divisions not within the service area of the IALR are also served by this governor's school ("The Governor's", n.d.). There are four faculty members at this site and is overseen by one administrator. Franklin County Schools is served by the Roanoke Valley Governor's School. There are 13 faculty members at the Roanoke Valley Governor's School and is overseen by one administrator. Other school divisions not within the service area of the IALR are also served by this governor's school ("Roanoke Valley", n.d.).

The number of instructional positions in the population of this study is 4,120 while the total number of principals this population numbers 108. Each school division within the service area of the IALR also has central office staff who are responsible for staff development and curriculum. The inclusion of central office staff increases the number of administrative staff in the population.

Table 3.1

*Participant Schools*

Table 3.1 (Continued)

| School Division              | School Level | School                 |
|------------------------------|--------------|------------------------|
| Danville City Public Schools | Alternative  | Fresh Start Academy    |
| Danville City Public Schools | Elementary   | Forest Hills Elem.     |
| Danville City Public Schools | Elementary   | G. L. H. Johnson Elem. |
| Danville City Public Schools | Elementary   | Glenwood Elem.         |
| Danville City Public Schools | Elementary   | Grove Park Elem.       |
| Danville City Public Schools | Elementary   | Irvin W. Taylor Elem   |
| Danville City Public Schools | Elementary   | Park Avenue Elementary |
| Danville City Public Schools | Elementary   | Schoolfield Elem       |
| Danville City Public Schools | Elementary   | W. Townes Lea Elem.    |
| Danville City Public Schools | Elementary   | Woodberry Hills Elem.  |
| Danville City Public Schools | Elementary   | Woodrow Wilson Elem.   |

(table 3.1 continues)

Table 3.1 (Continued)

| School Division                | School Level | School                         |
|--------------------------------|--------------|--------------------------------|
| Danville City Public Schools   | High         | Galileo Magnet High            |
| Danville City Public Schools   | High         | George Washington High         |
| Danville City Public Schools   | Middle       | Edwin A. Gibson Middle         |
| Danville City Public Schools   | Middle       | O. Trent Bonner Middle School  |
| Danville City Public Schools   | Middle       | Westwood Middle                |
| Danville City Public Schools   | Unknown      | Westmoreland Pre-School Feedin |
| Franklin County Public Schools | Elementary   | Ben. Franklin Middle-East      |
| Franklin County Public Schools | Elementary   | Boones Mill Elem.              |
| Franklin County Public Schools | Elementary   | Burnt Chimney Elem.            |
| Franklin County Public Schools | Elementary   | Callaway Elem.                 |
| Franklin County Public Schools | Elementary   | Dudley Elem.                   |
| Franklin County Public Schools | Elementary   | Ferrum Elem.                   |
| Franklin County Public Schools | Elementary   | Glade Hill Elem.               |

(table 3.1 continues)

Table 3.1 (Continued)

| School Division                | School Level | School                         |
|--------------------------------|--------------|--------------------------------|
| Franklin County Public Schools | Elementary   | Henry Elem.                    |
| Franklin County Public Schools | Elementary   | Lee M. Waid Elem.              |
| Franklin County Public Schools | Elementary   | Rocky Mount Elem.              |
| Franklin County Public Schools | Elementary   | Snow Creek Elem.               |
| Franklin County Public Schools | Elementary   | Sontag Elem.                   |
| Franklin County Public Schools | High         | Franklin County High           |
| Franklin County Public Schools | Middle       | Ben. Franklin Middle-West      |
| Franklin County Public Schools | Middle       | Gereau Ctr for Apl Tech&Career |
| Halifax County Public Schools  | Elementary   | C.H. Friend Elem               |
| Halifax County Public Schools  | Elementary   | Clays Mill Elem.               |
| Halifax County Public Schools  | Elementary   | Cluster Springs Elem.          |
| Halifax County Public Schools  | Elementary   | Halifax Elem.                  |
| Halifax County Public Schools  | Elementary   | Meadville Elem.                |

(table 3.1 continues)

Table 3.1 (Continued)

| School Division               | School Level | School                   |
|-------------------------------|--------------|--------------------------|
| Halifax County Public Schools | Elementary   | Scottsburg Elem.         |
| Halifax County Public Schools | Elementary   | Sinai Elem.              |
| Halifax County Public Schools | Elementary   | South of Dan Elem.       |
| Halifax County Public Schools | Elementary   | Sydnor Jennings Elem.    |
| Halifax County Public Schools | Elementary   | Turbeville Elem.         |
| Halifax County Public Schools | Elementary   | Washington-Coleman Elem  |
| Halifax County Public Schools | Elementary   | Wilson Memorial Elem.    |
| Halifax County Public Schools | High         | Halifax County High      |
| Halifax County Public Schools | Middle       | Halifax County Middle    |
| Henry County Public Schools   | Elementary   | Axton Elementary School  |
| Henry County Public Schools   | Elementary   | Campbell Court Elem.     |
| Henry County Public Schools   | Elementary   | Carver Elementary School |
| Henry County Public Schools   | Elementary   | Collinsville Primary     |

(table 3.1 continues)

Table 3.1 (Continued)

| School Division                  | School Level | School                         |
|----------------------------------|--------------|--------------------------------|
| Henry County Public Schools      | Elementary   | Irisburg Elem.                 |
| Henry County Public Schools      | Elementary   | John Redd Smith Elem.          |
| Henry County Public Schools      | Elementary   | Mt. Olivet Primary             |
| Henry County Public Schools      | Elementary   | Rich Acres Elem.               |
| Henry County Public Schools      | Elementary   | Ridgeway Elem.                 |
| Henry County Public Schools      | Elementary   | Sanville Elem.                 |
| Henry County Public Schools      | Elementary   | Stanleytown Elem.              |
| Henry County Public Schools      | High         | Bassett High                   |
| Henry County Public Schools      | High         | Magna Vista High               |
| Henry County Public Schools      | Middle       | Fieldale-Collinsville Middle S |
| Henry County Public Schools      | Middle       | Laurel Park Middle School      |
| Martinsville City Public Schools | Elementary   | Albert Harris Intermediate     |
| Martinsville City Public Schools | High         | Martinsville High              |

(table 3.1 continues)

Table 3.1 (Continued)

| School Division                    | School Level | School                         |
|------------------------------------|--------------|--------------------------------|
| Martinsville City Public Schools   | Middle       | Martinsville Middle School     |
| Martinsville City Public Schools   | Pre-School   | Clearview Early Childhood Cent |
| Martinsville City Public Schools   | Pre-School   | Patrick Henry Pre-School Cente |
| Martinsville City Public Schools   | Elementary   | Albert Harris Elementary       |
| Martinsville City Public Schools   | Elementary   | Patrick Henry Elementary       |
| Patrick County Public Schools      | Elementary   | Blue Ridge Elem.               |
| Patrick County Public Schools      | Elementary   | Hardin Reynolds Elem.          |
| Patrick County Public Schools      | Elementary   | Meadows of Dan Elem.           |
| Patrick County Public Schools      | Elementary   | Patrick Springs Elem.          |
| Patrick County Public Schools      | Elementary   | Stuart Elem.                   |
| Patrick County Public Schools      | Elementary   | Woolwine Elem.                 |
| Patrick County Public Schools      | High         | Patrick County High            |
| Pittsylvania County Public Schools | Alternative  | Regional Alternative Ctr       |

(table 3.1 continues)

Table 3.1 (Continued)

| School Division                    | School Level         | School                    |
|------------------------------------|----------------------|---------------------------|
| Pittsylvania County Public Schools | Career And Technical | Pittsylvania Voc-Tech Ctr |
| Pittsylvania County Public Schools | Elementary           | Brosville Elem.           |
| Pittsylvania County Public Schools | Elementary           | Chatham Elem.             |
| Pittsylvania County Public Schools | Elementary           | Gretna Elem.              |
| Pittsylvania County Public Schools | Elementary           | John L. Hurt Elem.        |
| Pittsylvania County Public Schools | Elementary           | Kentuck Elem.             |
| Pittsylvania County Public Schools | Elementary           | Mt. Airy Elem.            |
| Pittsylvania County Public Schools | Elementary           | Southside Elem.           |
| Pittsylvania County Public Schools | Elementary           | Stony Mill Elem.          |
| Pittsylvania County Public Schools | Elementary           | Twin Springs Elem.        |
| Pittsylvania County Public Schools | Elementary           | Union Hall Elem.          |
| Pittsylvania County Public Schools | High                 | Chatham High              |
| Pittsylvania County Public Schools | High                 | Dan River Sr. High        |

(table 3.1 continues)

Table 3.1 (Continued)

| School Division                    | School Level | School                       |
|------------------------------------|--------------|------------------------------|
| Pittsylvania County Public Schools | High         | Gretna Sr. High              |
| Pittsylvania County Public Schools | High         | Tunstall Sr. High            |
| Pittsylvania County Public Schools | Middle       | Chatham Middle               |
| Pittsylvania County Public Schools | Middle       | Dan River Middle             |
| Pittsylvania County Public Schools | Middle       | Gretna Middle                |
| Pittsylvania County Public Schools | Middle       | Tunstall Middle              |
| Mecklenburg County Public Schools  | Alternative  | Alternative Education Center |
| Mecklenburg County Public Schools  | Elementary   | Boydton Elem.                |
| Mecklenburg County Public Schools  | Elementary   | Buckhorn Elem.               |
| Mecklenburg County Public Schools  | Elementary   | Chase City Elem.             |
| Mecklenburg County Public Schools  | Elementary   | Clarksville Elem.            |
| Mecklenburg County Public Schools  | Elementary   | Lacrosse Elem.               |
| Mecklenburg County Public Schools  | Elementary   | South Hill Elem.             |

(table 3.1 continues)

Table 3.1 (Continued)

| School Division                   | School Level | School                                  |
|-----------------------------------|--------------|---|
| Mecklenburg County Public Schools | High         | Bluestone High                          |
| Mecklenburg County Public Schools | High         | Park View High                          |
| Mecklenburg County Public Schools | Middle       | Bluestone Middle                        |
| Mecklenburg County Public Schools | Middle       | Park View Middle                        |
|                                   | Governor's   | Piedmont Governor's School              |
|                                   | Governor's   | Governor's School of Southside Virginia |
|                                   | Governor's   | Roanoke Valley Governor's School        |

Table 3.2

*Demographic Characteristics of Schools Used in this Study*

| School Division    | Number of Elementary Schools | Number of Middle Schools | Number of High Schools | Other type of School | Total Number of Schools | Number of Elementary Instructional Positions | Number of Secondary Instructional Positions | Total Number of Instructional Positions |
|--------------------|------------------------------|--------------------------|------------------------|----------------------|-------------------------|--|---|---|
| Patrick County     | 6                            |                          | 1                      |                      | 7                       | 122.64                                       | 83.27                                       | 205.91                                  |
| Martinsville City  | 3                            | 1                        | 1                      | 2                    | 7                       | 147  | 102.1                                       | 249.1                                   |
| Mecklenburg County | 6                            | 2                        | 2                      | 1                    | 11                      | 249.95                                       | 175.5                                       | 425.45                                  |
| Halifax County     | 12                           | 1                        | 1                      |                      | 14                      | 317.3  | 259   | 576.3                                   |

(table 3.2 continues)

| School Division                   | Number of Elementary Schools | Number of Middle Schools | Number of High Schools | Other type of School | Total Number of Schools | Number of Elementary Instructional Positions | Number of Secondary Instructional Positions | Total Number of Instructional Positions |
|-----------------------------------|------------------------------|--------------------------|------------------------|----------------------|-------------------------|--|---|---|
| Franklin County                   | 12                           | 1                        | 1                      | 1                    | 15                      | 354.01                                       | 220.8                                       | 574.81                                  |
| Danville City                     | 10                           | 3                        | 2                      | 1                    | 16                      | 367.46                                       | 233.65                                      | 601.11                                  |
| Henry County                      | 11                           | 2                        | 2                      |                      | 15                      | 379.62                                       | 280.51                                      | 660.13                                  |
| Pittsylvania County               | 10                           | 4                        | 4                      | 2                    | 20                      | 528.06                                       | 272.34                                      | 800.34                                  |
| Piedmont Governor's School        |                              |                          | 1                      |                      | 1                       |  | 10  | 10                                      |
| Governor's School of Southside VA |                              |                          | 1                      |                      | 1                       |  | 4   | 10                                      |

(table 3.2 continues)

| School Division                  | Number of Elementary Schools | Number of Middle Schools | Number of High Schools | Other type of School | Total Number of Schools | Number of Elementary Instructional Positions | Number of Secondary Instructional Positions | Total Number of Instructional Positions |
|----------------------------------|------------------------------|--------------------------|------------------------|----------------------|-------------------------|--|---|---|
| Roanoke Valley Governor's School |                              |                          | 1                      |                      | 1                       |  | 13  | 13                                      |
| Total                            | 70                           | 14                       | 17                     | 7                    | 108                     | 2466.04                                      | 1654.17                                     | 4120.21                                 |

## Data Needs

The data needs for assessing the perceived needs of K-12 educators in the service region of the IALR in Southside Virginia were gathered by the use of four survey instruments. Principals, superintendents, and directors of instruction for a given school division each received a hyperlink to a separate survey instrument in which items were selected for inclusion that likely matched the participant's knowledge based upon his or her job description. Additionally, a fourth on line survey instrument gathered the perceived needs of teachers in the service region of the IALR. Principals of each school received an informational sheet for teachers within their building and were asked to distribute these sheets to teachers. This informational sheet (see appendix B) described the purpose of the study and provided teachers a hyperlink to the teacher survey instrument. The instructional leaders within both the schools and school divisions along with input from teachers provided the perceptions of what K-12 educators in the service area of the IALR need. Specifically, they provided their perceptions on teaching staff development needs, administrative staff development needs, curricular needs, and the other needs they may have. Capturing these perceptions from both the instructional leaders at the school level and division level as well as from teachers of each school division within the service region of the IALR provided reliability of the data. Gall, Gall, & Borg (2005) suggest survey research is appropriate when collecting data about "participants' beliefs, attitudes, interests, or behaviour" (p. 180). They further suggest that data collected of less sensitive topics such as the topic at hand are appropriately captured by the use of a survey instrument. The designed instruments gathered data relative to the study's research question and its subordinate questions.

### Instrumentation

A review of the existing needs assessment instruments did not yield a survey instrument suitable for collecting the needed data. The identified gap in the literature concerning an association between research centers and K-12 schools coupled with the unique nature of the IALR and its localized service area necessitated the need to develop questionnaires that were specifically designed to gather the data needed to address the research question at hand.

Kaufman & English (1979) describe needs assessment loosely as a collection of prioritized gaps schools or school system can use to create “deep change” in the system. They propose six models of needs assessments all based on the premise that schools have the power to affect change once the gaps are identified by examining what schools are doing versus what schools should do. The study differs from a true needs assessment in two important ways. First, the school divisions associated with the IALR do not control the IALR and are therefore not in position to affect deep changes in the IALR. Secondly, the IALR has only provided services to school divisions since the summer of 2004 (L. Nilsen, personal communication, June 15, 2006). It may be premature to examine what the IALR is providing school divisions versus what the IALR should be doing for school divisions based on less than two years of experience. The study is similar to a needs assessment in that it identified perceived needs of school divisions within the service area of the IALR.

Self developed survey instruments must be reliable and valid if the derived data are to be useful (Ary, Jacobs, & Razavieh, 1996 ;Bell, 1999). Validity of a survey instrument is defined as “the degree to which a survey instrument assess what it purports to measure”(Fink, 2003, p. 165). Two measures of validity were established for each survey instrument designed for use in the proposed study. Face validity was assured by the development of a matrix in which items of each instrument were linked to the appropriate subordinate research question. This insured the survey

items adequately addressed the research question. Content validity was insured by pretesting the survey items as suggested by Ary, et al.(1996) and Bell, (1999). “[I]t is essential that the questionnaire be pretested in order to identify ambiguities, misunderstandings, or other inadequacies” (Ary, et al., 1985, p. 351). To this end, opinions were elicited from colleagues familiar with the study as to the clarity and validity of the survey items. Items lacking clarity or validity were either eliminated or reworded.

Fink (2003) states reliability is concerned with the consistency of an instrument. While Bell (1999) suggests that the use of mechanisms for checking the reliability of a survey instrument such as the use of test-retest, alternate forms methods, or a split-half method are not necessary unless the data will be used to develop a test or scale. Since the study does not intend to use collected data for these purposes, reliability was established through piloting the developed instruments. Bell (1999) advises “the check for reliability will come at the stage of question wording and piloting the instrument”. A description of the piloting process that was used in the proposed study is provided later in this chapter.

The purposes of the IALR as previously stated in the Code of Virginia do not specify a content area in which the IALR will provide assistance to K-12 schools. However, the IALR does specify it will provide faculty development opportunities to K-12 teachers and administrators in the areas of math, science and technology ("Teacher education", n.d.). This study sought to identify the perceived needs K-12 educators have regardless of content area. There are four reasons for this rationale. First, since the Code of Virginia does not exclude any content area from the purview of the IALR, other content areas such as reading can be viewed as part of its academic mandate. Secondly, students engaged in other academic content areas such as social studies can benefit from K-12 educators who have increased their capacity in math, science and technology. Thirdly, the

exclusion of reading and writing faculty development may foster an already existing deficiency in the students in the geographical region served by the IALR. This may in turn limit students' abilities to access the benefits educators have received from the IALR in other academic areas. Finally, school divisions served by the IALR must provide educational opportunities in areas other than math, science and technology. Therefore, educators in these school divisions may realistically have needs in areas other than math, science and technology. Limiting the proposed study to just three areas may jeopardize the validity of the study relative to its research question.

The survey instruments were constructed following the suggestions of experts in the field such as Ary, Jacobs, & Razavieh (1985) and Bell (1999). Ultimately, instruments specific to each category of participant were designed to address items associated with the four subordinate questions that will answer the research question at hand. This resulted in a total of four instruments. All items of the instruments were entered into a matrix. The matrix identified to which subordinate research question the item was linked and which category of participant would answer the item. This process allowed all subordinate questions to be addressed and identified the participant most likely to have the knowledge to answer the question and thereby provide accurate data. Refer to Table 3.3 to review the item matrix.

Bell (1999) states "All data gathering instruments should be piloted to test how long it takes recipients to complete them, to check that all questions and instructions are clear and to enable you to remove any items which do not yield usable data." The instruments were piloted as Bell (1999) suggests "on a group similar to the one that will form the population of your study". Relative to the instrument this pilot group were asked the following suggested questions from Bell (1999, p. 128):

1. How long did it take you to complete?

Table 3.3

Item Matrix

| Subordinate Question   | Survey Question  | Participant   |
|--|--|---|
| What are the staff development needs of K-12 teachers in the service region of the IALR in Southside Virginia? | Teachers need additional staff development in the area(s) of:<br>a. Math<br>b. Science<br>c. Social Studies<br>d. English  | Superintendent<br>Director/Assistant Superintendent for Instruction<br>Principal<br>Teacher |
| What are the staff development needs of K-12 teachers in the service region of the IALR in Southside Virginia? | Teachers need additional staff development in the area(s) of:<br>a. Reading<br>b. Technology<br>c. Working with “At-Risk” youth<br>d. Other  | Director/Assistant Superintendent for Instruction<br>Principal<br>Teacher                   |
| What are the staff development needs of K-12 teachers in the service region of the IALR in Southside Virginia? | Teachers need additional staff development in the area(s) of:<br>a. Arts<br>b. Career and Technical Education<br>c. Early Childhood Education<br>d. Special Education  | Superintendent  |
| What are the staff development needs of K-12 teachers in the service region of the IALR in Southside Virginia? | I would like the research center to offer staff development or provide information on existing education programs and resources in the area(s):<br>a. Math<br>b. Science<br>c. Social Studies<br>d. Reading<br>e. English<br>f. Technology<br>g. At-Risk<br>h. Other | Principal<br>Teacher  |
| What are the staff development needs of K-12 teachers in the service region of the IALR in Southside Virginia? | Teachers <b>most</b> need additional staff development in the area of:<br>a. Math<br>b. Science<br>c. Social Studies<br>d. Reading<br>e. English<br>f. Technology<br>g. Working with “At-Risk” youth<br>h. Other   | Director/Assistant Superintendent for Instruction<br>Principal<br>Teacher                   |
| What are the staff development needs of K-   | Teachers in my school division need improved access to higher education for the purposes of graduate programs in   | Table 3.3. Item Matrix Continued<br>Superintendent  |

| Subordinate Question  | Survey Question   | Participant  |
|---|---|--|
| 12 teachers in the service region of the IALR in Southside Virginia?  | the area of <ul style="list-style-type: none"> <li>a. Curriculum &amp; Instruction</li> <li>b. Administration and supervision</li> <li>c. Speech Therapy</li> <li>d. Psychology</li> <li>e. Math</li> <li>f. Science</li> <li>g. Social Studies</li> <li>h. English</li> <li>i. Arts</li> <li>j. Vocational Education</li> <li>k. Early Childhood Education</li> <li>l. Special Education</li> <li>m. Other</li> </ul>  |  |
| What are the staff development needs of K-12 teachers in the service region of the IALR in Southside Virginia?    | I would like improved access to higher education for the purposes of graduate programs.   | Teacher  |
| What are the staff development needs of K-12 administrators the service region of the IALR in Southside Virginia? | Administrators in my building need improved local access to higher education for the purposes of graduate programs (Ed.D., Ed.S., Ph.D.).   | Superintendent<br>Principal  |
| What are the staff development needs of K-12 administrators the service region of the IALR in Southside Virginia? | Administrators in my building need additional staff development in the area of <ul style="list-style-type: none"> <li>a. School law</li> <li>b. School finance</li> <li>c. Evaluating instruction</li> <li>d. Special Education</li> <li>e. Understanding the implications of NCLB Legislation</li> <li>f. Classroom use of technology</li> <li>g. Administrative use of technology</li> </ul>  | Superintendent<br>Principal  |
| What are the curricular needs of K-12 educators in the service region of the IALR in Southside Virginia?          | Teachers need additional staff development in content (math, science, social studies, reading, English) areas that is designed <ul style="list-style-type: none"> <li>a. to enable teachers to gain content knowledge.</li> <li>b. to enable teachers to more effectively deliver instruction.</li> <li>c. to enable students to better perform on Standards of Learning tests.</li> <li>d. to better integrate technology into instruction.</li> <li>e. to meet highly qualified standards.</li> </ul> | Assistant<br>Superintendent/Director of<br>Instruction<br>Principals<br>Teachers |
| What are the curricular needs of K-12 educators   | Teachers need additional staff development in technology for what purpose?  | Principal<br>Teacher   |

Table 3.3 Item Matrix Continued

| Subordinate Question  | Survey Question  | Participant  |
|---|--|--|
| <p>in the service region of the IALR in Southside Virginia?</p> <p>What are the staff development needs of K-12 teachers in the service region of the IALR in Southside Virginia?</p> | <p>Teachers would take advantage of educational and staff development opportunities if offered:</p> <p>a. via web-based means</p> <p>b. at the research center</p> | <p>Superintendent<br/>Assistant<br/>Superintendent/Director of Instruction<br/>Principals<br/>Teachers</p> |
| <p>What are other needs of school divisions in the service region of the IALR in Southside Virginia?</p>  | <p>I have visited the research center.</p>   | <p>Superintendent<br/>Assistant<br/>Superintendent/Director of Instruction<br/>Principals<br/>Teachers</p> |
| <p>What are other needs of school divisions in the service region of the IALR in Southside Virginia?</p>  | <p>I have had direct communication with the research center.</p>   | <p>Superintendent<br/>Assistant<br/>Superintendent/Director of Instruction</p>                             |
| <p>What are other needs of school divisions in the service region of the IALR in Southside Virginia?</p>  | <p>My school division has a clear delineation of what the IALR can offer my school division.</p>   | <p>Superintendent</p>  |
| <p>What are other needs of school divisions in the service region of the IALR in Southside Virginia?</p>  | <p>My school division has good lines of communication with the IALR</p>  | <p>Superintendent</p>  |
| <p>What are other needs of school divisions in the service region of the IALR in Southside Virginia?</p>  | <p>I would like to know what the research center can offer.</p>  | <p>Assistant<br/>Superintendent/Director of Instruction<br/>Principals<br/>Teachers</p>                    |
| <p>What are other needs of school divisions in the service region of the IALR in Southside Virginia?</p>  | <p>My school division or I have had input or would like to provide input into the staff development that has been offered by the research center.</p>              | <p>Superintendent<br/>Assistant<br/>Superintendent/Director of Instruction<br/>Principals<br/>Teachers</p> |
| <p>What are other needs of school divisions in the service region of the IALR in Southside Virginia?</p>  | <p>The staff development that has been offered by the IALR was effective in meeting my staff development needs.</p>  | <p>Principal<br/>Teacher</p>   |

Table 3.3. Item Matrix Continued

|  |  |                                     |
|--|--|-------------------------------------|
| <p>What are other needs of school divisions in the</p> | <p>What staff have participated in staff development opportunities given by the research center?</p> | <p>Superintendent<br/>Principal</p> |
|--|--|-------------------------------------|

| <b>Subordinate Question</b>   | <b>Survey Question</b>  | <b>Participant</b> |
|---|---|--------------------|
| service region of the IALR in Southside Virginia?   |   | Teacher            |
| What are other needs of school divisions in the service region of the IALR in Southside Virginia? | <p>The IALR has offered staff development for teachers in my building in the area(s) of:</p> <ul style="list-style-type: none"> <li>a. Math</li> <li>b. Science</li> <li>c. Social Studies</li> <li>d. Reading</li> <li>e. English</li> <li>f. Technology</li> <li>g. Working with “At-Risk” youth</li> <li>h. Other</li> </ul> | Principal          |

2. Were the instructions clear?
3. Were any of the questions unclear or ambiguous? If so, will you say which and why?
4. Did you object to answering any of the questions?
5. In your opinion, has any major topic been omitted?
6. Was the layout of the questionnaire clear/attractive?
7. Any comments

A pilot group consisting of six school administrators from three different school divisions used a feedback form (see appendix A) to provide their suggestions for improving the survey instruments. The pilot group consisted of three building level administrators and three central office personnel who were not in the population of this study. Additional clarity and validity were obtained by revising the instrument in light of the responses given by the pilot group.

Building level and division level administrators as well as teachers were chosen to participate in the study because they have the information relative to the subordinate questions of the study that are designed to answer the research question. “A survey that covers the entire population of interest is referred to as a census” (Ary, et al., 1985, p. 337). Since the population as previously described is located within the same geographic area, it was determined that a census survey would be appropriate and would eliminate the need to compute a statically suitable sample size.

Each superintendent in the IALR’s service region received a letter that described the study and asked for permission for administrative and teaching staff within his or her division to participate in the study. (see Appendix C) and copies of the survey instruments prior to collecting data. A description of the study and copies of the survey instruments were also shared with the IALR prior to collecting data.

Because of the easy access school administrators and teachers have to the World Wide Web and to e-mail, it was determined a hyperlink to the appropriate survey instrument would be e-mailed to each administrator for completion. Teachers received an informational sheet with the hyperlink to the teacher survey as previously described. This appeared to be an efficient means of both distributing the instrument and receiving the data. E-mail addresses of administrators were obtained from the school division's web site, the school division's central office, or by personal contact. Once the distribution list was developed, each building level administrator, superintendent, director of instruction, and director of a governor's school within the IALR's service area were e-mailed directions and the hyperlink to access the appropriate online survey. See Appendix B for the generic form used. Each group of administrative participants were e-mailed the text of the generic form. However, the specific URL for the correct survey was sent to each participant based on his or her job as principal, superintendent or director/assistant superintendent for instruction. Participants were given one week to respond. Follow up e-mail messages were sent seven days after the initial e-mails. Principals received a follow up letter that also included a paper form requesting teacher participation. See Appendix D. The message once again contained instructions and the hyperlink to the appropriate survey instrument. Additional efforts to increase the response rate included follow up letters to participants as well as telephone calls to the participants.

### Analysis of Data

Data collected from survey instruments was either nominal or ordinal. These self reported needs of school divisions relative to the IALR were used to answer the research question: What are the perceived needs of K – 12 educators in the service region of the Institute of Advanced Learning and Research (IALR)? The use of descriptive statistics is an appropriate method for reporting the findings of the study (Fink, 2003). Therefore, data were reported in terms of measures of central tendency. “These are measures or statistics that describe the location of the center of a distribution or an arrangement of data that shows the frequency of occurrence of the values of a variable or characteristic” (Fink, 2003, p. 38). Analysis of the data by the use of a statistical test will not be appropriate given the research question and gathered data.

Data collected from each of the four surveys were initially stored electronically as tab delimited files. These tab delimited files were eventually imported in SPSS 12.0 and Microsoft Excel. These two programs enabled data to be easily tabulated for inclusion into the specific tables used in chapter four.

## CHAPTER FOUR

### Findings of the Study

This chapter describes the findings of the survey instruments used and illustrates (1) the perceived needs of K – 12 educators in the service region of the IALR located in Southside Virginia relative to staff development and continuing education for teachers and administrators, (2) possible means of delivering such staff development and continuing education opportunities by the research center, (3) the communication school divisions have had with the research center, (4) the input school divisions have had into the staff development opportunities given by the research center, (5) the perceived effectiveness of the staff development that has been given by the research center, and (6) the participation educators in the staff development that has been offered by the research center. Descriptive statistics are used to present these findings.

### Profile of the Sample

As previously described in chapter 3, a census survey was used. Data on the specific school divisions, schools, and staff within the scope of this study were discussed in chapter three and are outlined in tables 3.1 and 3.2 respectively. Not all of the population responded to the survey instruments used. Demographic information collected from each of the four survey instruments used indicated eight superintendents and eight directors/assistant superintendents for instruction participated in their respective surveys. Both of these participation rates were 100%. The collected demographic information also revealed 76 (70.4%) principals participated and 262 (6.4%) teachers participated in their respective surveys. Table 4.1 displays participant information by school division and table 4.2 displays participant information by school level.

Table 4.1

*Participants by School Division*

| School Division     | Superintendents<br><i>n</i> = 8 | Director/Assistant<br>Superintendent of<br>Instruction<br><i>n</i> = 8 | Principals<br><i>n</i> = 108 | Teachers<br><i>n</i> = 4120 | Total      |
|---------------------|---------------------------------|--|------------------------------|-----------------------------|------------|
| Danville City       | 1                               | 1  | 14                           | 18                          | 34         |
| Franklin County     | 1                               | 1  | 7                            | 76                          | 85         |
| Governor's School   |                                 |  | 3                            | 2                           | 5          |
| Halifax County      | 1                               | 1  | 11                           | 18                          | 31         |
| Henry County        | 1                               | 1  | 12                           | 38                          | 52         |
| Martinsville City   | 1                               | 1  | 3                            | 1                           | 6          |
| Mecklenburg County  | 1                               | 1  | 3                            | 0                           | 5          |
| Patrick County      | 1                               | 1  | 3                            | 20                          | 25         |
| Pittsylvania County | 1                               | 1  | 20                           | 89                          | 111        |
| <b>Total</b>        | <b>8</b>                        | <b>8</b>   | <b>76</b>                    | <b>262</b>                  | <b>354</b> |

*n* = study population

Table 4.2

*Participants by School Level*

| School Level | Principals<br><i>n</i> = 108 | Teachers<br><i>n</i> = 4120 | Total |
|--------------|------------------------------|-----------------------------|-------|
| Elementary   | 48                           | 94                          | 142   |
| Middle       | 10                           | 49                          | 59    |
| High         | 18                           | 119                         | 137   |
| Total        | 76                           | 262                         | 338   |

*n* = study population

### Responses to Survey Items

Items from each of the four surveys that are similar are grouped together and reported in individual tables within this chapter. Items from each survey are identified with S, I, P, or T indicating items from the superintendent survey (Appendix E), director/assistant superintendent for instruction survey (Appendix F), principal survey (Appendix G), or teacher survey (Appendix H) respectfully. Directors of instruction and assistant superintendents for instruction who participated in the study will be collectively referred to as directors of instruction when describing their responses. Items from each survey that are not similar to other survey items are reported individually. As previously discussed in chapter three, not all participants were asked to respond to the same items. Items were directed to the individuals most likely to have the knowledge to answer the item. This process also allowed data on a larger number of individual items to be collected and allowed all instruments to be completed by respondents in a relatively short time.

## Perceived Needs of K – 12 Educators in Southside Virginia

*Teachers need for continuing education or staff development in math*

Almost all superintendents (87.5%), and all of the directors of instruction, either agreed or strongly agreed with the need for additional staff development or continuing education in the area of mathematics. One superintendent strongly disagreed with this need. Principals (82.9%) and 43.9% of teachers either agreed or strongly agreed with the need for additional staff development or continuing education in the area of math for teachers. Teachers agreed or strongly agreed with this statement to a lesser extent than the other three groups. Because of the larger number of teachers (n=262) as compared to the other three groups (n=92) participating in the study, the overall agree or strongly agree cumulative value (54.5%) does not reflect the perceived needs of teachers held by superintendents, directors of instruction, or principals relative to additional math staff development.

Table 4.3

*Responses to Survey Questions S2, I2, P3, T3. Teachers need continuing education/ additional staff development in the area of math.*

|   | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | Total |
|---|-------------------|--------|---------|----------|----------------------|-------|
| Superintendents   | 6                 | 1      |         |          | 1                    | 8     |
| %   | (75)              | (12.5) |         |          | (12.5)               | (100) |
| Director/Assistant<br>Superintendents of<br>Instruction | 5                 | 3      |         |          |                      | 8     |
| %   | (62.5)            | (37.5) |         |          |                      | (100) |
| Principals  | 19                | 44     | 10      | 3        |                      | 76    |
| %   | (25.0)            | (57.9) | (13.2)  | (3.9)    |                      | (100) |
| Teachers  | 41                | 74     | 103     | 30       | 14                   | 262   |
| %   | (15.6)            | (28.2) | (39.4)  | (11.5)   | (5.3)                | (100) |
| Total   | 71                | 122    | 113     | 33       | 15                   | 354   |
| %   | (20.1)            | (34.5) | (31.9)  | (9.3)    | (4.2)                | (100) |

*Teachers need for continuing education or staff development in science*

All of the superintendents, 87.5% of directors for instruction, 76.3% of principals, and 44.6% of teachers either strongly agreed or agreed on the need for additional staff development or continuing education in the area of science for teachers. Teachers agreed or strongly agreed with this statement to a lesser extent than the other three groups. Because of the larger number of teachers (n=262) as compared to the other three groups (n=92) participating in the study, the overall agree or strongly agree cumulative value (54.1%) does not reflect the perceived needs of teachers held by superintendents, directors of instruction, or principals relative to additional science staff development.

Table 4.4

*Responses to Survey Questions S3, I3, P4, T4. Teachers need continuing education/ additional staff development in the area of science.*

|   | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | Total |
|---|-------------------|--------|---------|----------|----------------------|-------|
| Superintendents   | 5                 | 3      |         |          |                      | 8     |
| %   | (62.5)            | (37.5) |         |          |                      | (100) |
| Director/Assistant<br>Superintendents of<br>Instruction | 1                 | 6      | 1       |          |                      | 8     |
| %   | (12.5)            | (75.0) | (12.5)  |          |                      | (100) |
| Principals  | 13                | 45     | 14      | 1        | 3                    | 76    |
| %   | (17.1)            | (59.2) | (18.5)  | (1.3)    | (3.9)                | (100) |
| Teachers  | 31                | 86     | 99      | 32       | 14                   | 262   |
| %   | (11.8)            | (32.8) | (37.9)  | (12.2)   | (5.3)                | (100) |
| Total   | 50                | 140    | 114     | 33       | 17                   | 354   |
| %   | (14.1)            | (40.0) | (32.0)  | (9.3)    | (4.6)                | (100) |

*Teachers need for continuing education or staff development in social studies*

All four groups indicated less of a perceived need for staff development in the area of social studies as compared to math and science. Seventy-five percent of the superintendents, 62.5% of directors for instruction, 56.6% of principals, and 40.9% of teachers either strongly agreed or agreed on the need for additional staff development or continuing education in the area of social studies for teachers. Teachers agreed or strongly agreed with this statement to a lesser extent than the other three groups. Because of the larger number of teachers (n=262) as compared to the other three groups (n=92) participating in the study, the overall agree or strongly agree cumulative value (45.7%) does not reflect the perceived needs of teachers held by superintendents, directors of instruction, or principals relative to additional social studies staff development.

Table 4.5

*Responses to Survey Questions S4, I4, P5, T5. Teachers need continuing education/ additional staff development in the area of social studies.*

|   | Strongly<br>Agree | Agree      | Neutral    | Disagree  | Strongly<br>Disagree | Total      |
|---|-------------------|------------|------------|-----------|----------------------|------------|
| Superintendents   | 1                 | 5          | 2          |           |                      | 8          |
| %   | (12.5)            | (62.5)     | (25.0)     |           |                      | (100)      |
| Director/Assistant<br>Superintendents of<br>Instruction |                   | 5          | 3          |           |                      | 8          |
| %   |                   | (62.5)     | (37.5)     |           |                      | (100)      |
| Principals  | 7                 | 36         | 20         | 10        | 3                    | 76         |
| %   | (9.2)             | (47.4)     | (26.3)     | (13.2)    | (3.9)                | (100)      |
| Teachers  | 28                | 79         | 114        | 25        | 16                   | 262        |
| %   | (10.7)            | (30.2)     | (43.5)     | (9.5)     | (6.1)                | (100)      |
| <b>Total</b>  | <b>36</b>         | <b>125</b> | <b>139</b> | <b>35</b> | <b>19</b>            | <b>354</b> |
| %   | (10.2)            | (35.3)     | (39.2)     | (9.9)     | (5.4)                | (100)      |

*Teachers need for continuing education or staff development in English*

Superintendents (75%) agreed or strongly agreed with the need teachers have for continuing education or staff development in the area of English. An equal number of directors of instruction (75%), 57.9% of principals, and 53.8% of teachers either strongly agreed or agreed on the need for additional staff development or continuing education in the area of English for teachers. Teachers and principals agreed or strongly agreed with this statement in roughly the same percentages. The overall agree or strongly agree cumulative value of the two groups (55.7%) closely matches the separate percentages of both principals and teachers as a perceived need of teachers held by principals and teachers relative to additional English staff development.

Table 4.6

*Responses to Survey Questions S5, I6, P7, T7. Teachers need continuing education/ additional staff development in the area of English.*

|   | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | Total |
|---|-------------------|--------|---------|----------|----------------------|-------|
| Superintendents   | 1                 | 5      | 2       |          |                      | 8     |
| %   | (12.5)            | (62.5) | (25.0)  |          |                      | (100) |
| Director/Assistant<br>Superintendents of<br>Instruction |                   | 6      | 2       |          |                      | 8     |
| %   |                   | (75.0) | (25.0)  |          |                      | (100) |
| Principals  | 9                 | 35     | 25      | 5        | 2                    | 76    |
| %   | (11.8)            | (46.1) | (32.9)  | (6.6)    | (2.6)                | (100) |
| Teachers  | 61                | 80     | 95      | 18       | 8                    | 262   |
| %   | (23.3)            | (30.5) | (36.2)  | (6.9)    | (3.1)                | (100) |
| Total   | 71                | 126    | 124     | 23       | 10                   | 354   |
| %   | (20.1)            | (35.6) | (34.2)  | (6.5)    | (3.6)                | (100) |

*Teachers need for continuing education or staff development in arts*

Three (37.5%) superintendents either agreed or strongly agreed with the need for improved access to higher education for the purposes of continuing education in the area of arts. Because of the small number of art teachers within each school division and the possible lack of art programs at every school within a given school division, superintendents were the only group asked this item. It was felt in light of the relatively smaller number of art teachers in each school division as compared to teachers in other areas, limiting the number of respondents to those that have a better understanding of the need for art continuing education or staff development within the a school division was appropriate. Four of the remaining superintendents did not have an opinion on this perceived need and one failed to respond to this survey item.

Table 4.7

*Responses to Survey Question S6. “Teachers in my school division need improved access to higher education for the purposes of continuing education in the area of arts ”*

|                 | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | Total  |
|-----------------|-------------------|--------|---------|----------|----------------------|--------|
| Superintendents | 1                 | 2      | 4       |          |                      | 7      |
| %               | (12.5)            | (25.0) | (50.0)  |          |                      | (87.5) |

Note. N= 8

*Teachers need for continuing education or staff development in career and technical education*

Six (75%) superintendents either agreed or strongly agreed with the need for improved access to higher education for the purposes of continuing education in the area of career and technical education. Because of the smaller number of career and technical teachers within each school division and the possible lack of career and technical programs at every school within a given school division, superintendents were the only group asked this item. It was felt in light of the relatively smaller number of career and technical teachers in each school division as compared to teachers in other areas, limiting the number of respondents to those that have a better understanding of the need for career and technical continuing education or staff development within the a school division was appropriate. The remaining superintendents did not have an opinion on this perceived need.

Table 4.8

*Responses to Survey Question S7. “Teachers in my school division need improved access to higher education for the purposes of continuing education in the area of career and technical education.”*

|                 | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | Total  |
|-----------------|-------------------|--------|---------|----------|----------------------|--------|
| Superintendents | 1                 | 5      | 1       |          |                      | 7      |
| %               | (12.5)            | (62.5) | (12.5)  |          |                      | (87.5) |

Note. N= 8

*Teachers need for continuing education or staff development in early childhood education*

Five (62.5%) superintendents either agreed or strongly agreed with the need for improved access to higher education for the purposes of continuing education in the area of early childhood education. Because of the smaller number of early childhood education teachers within each school division and the possible lack of these programs at every school within a given school division, superintendents were the only group asked this item. It was felt in light of the relatively smaller number of early childhood teachers in each school division as compared to teachers in other areas, limiting the number of respondents to those that have a better understanding of the need for early childhood continuing education or staff development within the a school division was appropriate. The remaining superintendents did not have an opinion on this perceived need.

Table 4.9

*Responses to Survey Question S8. “Teachers in my school division need improved access to higher*

*Responses to Survey Question S 9*

|                 | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | Total |
|-----------------|-------------------|--------|---------|----------|----------------------|-------|
| Superintendents | 1                 | 4      | 3       |          |                      | 8     |
| %               | (12.5)            | (50.0) | (37.5)  |          |                      | (100) |

Note. N= 8

*Teachers need for additional staff development in the area of technology*

Directors of instruction (87.5%) agreed or strongly agreed with the need teachers have for additional staff development in the area of technology. Principals (77.7%) and nearly as many teachers (73.7%) also either agreed or strongly agreed that teachers need additional staff development in the area of technology. Superintendents were not asked to respond to this item since the respondent groups most likely had the knowledge to answer this item. The overall agree or strongly agree cumulative value of these respondents (N=346) was 74.9%. The remaining respondents were either neutral (19.4%), disagreed (2.9%), or strongly disagreed (1.7%) that teachers need additional staff development in technology.

Table 4.10

*Responses to Survey Questions I7, P8, T8. Teachers need additional staff development in the area of technology.*

|                                | Strongly Agree | Agree  | Neutral | Disagree | Strongly Disagree | Total |
|--------------------------------|----------------|--------|---------|----------|-------------------|-------|
| Director/Assistant             | 2              | 5      | 1       |          |                   | 8     |
| Superintendents of Instruction |                |        |         |          |                   |       |
| %                              | (25.0)         | (62.5) | (12.5)  |          |                   | (100) |
| Principals                     | 17             | 42     | 15      | 2        |                   | 76    |
| %                              | (22.4)         | (55.3) | (19.7)  | (2.6)    |                   | (100) |
| Teachers                       | 73             | 120    | 55      | 8        | 6                 | 262   |
| %                              | (27.9)         | (45.8) | (20.9)  | (3.1)    | (2.3)             | (100) |
| Total                          | 92             | 167    | 71      | 10       | 6                 | 346   |
| %                              | (26.6)         | (48.3) | (20.5)  | (2.9)    | (1.7)             | (100) |

*Teachers need for additional staff development in the area of reading*

All directors of instruction agreed or strongly agreed with the need teachers have for additional staff development in the area of reading. Principals (73.7%) and 61.9 % of teachers also either agreed or strongly agreed that teachers need additional staff development in the area of reading. Superintendents were not asked to respond to this item. The overall agree or strongly agree cumulative value of these respondents (N=346) was 65.4%. Twenty-four percent of respondents were neutral. Most (n=73) neutral respondents were teachers. Only 6.9% of all respondents disagreed or strongly disagreed (2%) that teachers need additional staff development in reading.

Table 4.11

*Responses to Survey Questions I5, P6, T6. Teachers need continuing education/ additional staff development in the area of reading.*

|                                | Strongly Agree | Agree  | Neutral | Disagree | Strongly Disagree | Total |
|--------------------------------|----------------|--------|---------|----------|-------------------|-------|
| Director/Assistant             | 5              | 3      |         |          |                   | 8     |
| Superintendents of Instruction |                |        |         |          |                   |       |
| %                              | (62.5)         | (37.5) |         |          |                   | (100) |
| Principals                     | 26             | 30     | 13      | 5        | 2                 | 76    |
| %                              | (34.2)         | (39.5) | (17.1)  | (6.6)    | (2.6)             | (100) |
| Teachers                       | 73             | 89     | 76      | 19       | 5                 | 262   |
| %                              | (27.9)         | (34.0) | (28.9)  | (7.3)    | (1.9)             | (100) |
| Total                          | 104            | 122    | 89      | 24       | 7                 | 346   |
| %                              | (30.1)         | (35.3) | (25.7)  | (6.9)    | (2.0)             | (100) |

*Teachers need for continuing education or staff development in special education*

All superintendents either agreed or strongly agreed with the need teachers have for improved access to higher education for the purposes of continuing education in the area of special education. Because of the smaller number of special education teachers within each school division, superintendents were the only group asked this item. It was felt in light of the relatively smaller number of special education teachers in each school division as compared to teachers in other areas, limiting the number of respondents to those that have a better understanding of the need for special education continuing education or staff development within the a school division was appropriate.

Table 4.12

*Responses to Survey Question S 9. “Teachers in my school division need improved access to higher education for the purposes of continuing education in the area of special education. “*

|                 | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | Total |
|-----------------|-------------------|--------|---------|----------|----------------------|-------|
| Superintendents | 5                 | 3      |         |          |                      | 8     |
| %               | (62.5)            | (37.5) |         |          |                      | (100) |

*Teachers need for additional staff development in working with “At-Risk” youth*

Seven (87.5%) directors of instruction agreed or strongly agreed with the need teachers have for additional staff development in the area working with At-Risk youth. Principals (92.1%) and 72.5 % of teachers also either agreed or strongly agreed that teachers need additional staff development in the area of working with At-Risk youth. Superintendents were not asked to respond to this item since the respondent groups most likely had the knowledge to answer this item. The overall agree or strongly agree cumulative value of these respondents (N=346) was 77.2%. Sixteen percent of respondents were neutral. Forty-nine of the total 55 neutral respondents were teachers. Only 4.6% of all respondents disagreed or strongly disagreed (1.7%) that teachers need additional staff development in working with At-Risk youth.

Table 4.13

*Responses to Survey Questions I8, P11, T11. Teachers need staff development in working with “At-Risk” youth:*

|   | Strongly<br>Agree | Agree         | Neutral      | Disagree    | Strongly<br>Disagree | Total        |
|---|-------------------|---------------|--------------|-------------|----------------------|--------------|
| Director/Assistant<br>Superintendent<br>for Instruction<br><i>n</i> = 8 | 5<br>(62.5)       | 2<br>(25.0)   | 1<br>(12.5)  |             |                      | 8<br>(100)   |
| Principals<br><i>n</i> = 76   | 38<br>(50.0)      | 32<br>(42.1)  | 5<br>(6.6)   | 1<br>(1.3)  |                      | 76<br>(100)  |
| Teachers<br><i>n</i> = 262  | 92<br>(35.1)      | 98<br>(37.4)  | 51<br>(19.5) | 15<br>(5.7) | 6<br>(2.3)           | 76<br>(100)  |
| Total<br>N= 346   | 135<br>(39.0)     | 132<br>(38.2) | 57<br>(16.5) | 16<br>(4.6) | 6<br>(1.7)           | 346<br>(100) |

*I would like the research center to offer staff development in the area(s)*

Principals and teachers were asked what areas of staff development they would like to see the research center offer. Technology (46.7%) and working with At-Risk youth (48.8%) were the two areas most chosen by respondents. Math (37.3%) and reading (36.1%) were the next two most chosen areas of staff development respondents would like for the research center to offer. Science (28.7%), English (28.1%), social studies (24.0%), and other (8.6%) were also chosen by respondents.

Table 4.14

*Responses to Survey Questions P20, T19 . I would like the research center to offer staff development in the area(s)*

|            | Math   | Science | Social Studies | Reading | English | Technology | At-Risk | Other |
|------------|--------|---------|----------------|---------|---------|------------|---------|-------|
| Principals | 48     | 32      | 18             | 29      | 19      | 28         | 44      | 5     |
| %          | (63.2) | (42.1)  | (23.7)         | (38.2)  | (25.0)  | (36.8)     | (57.9)  | (6.6) |
| Teachers   | 78     | 65      | 63             | 93      | 76      | 130        | 121     | 24    |
| %          | (29.8) | (24.8)  | (24.0)         | (35.5)  | (29.0)  | (49.6)     | (46.2)  | (9.2) |
| Total      | 126    | 97      | 81             | 122     | 95      | 158        | 165     | 29    |
| %          | (37.3) | (28.7)  | (24.0)         | (36.1)  | (28.1)  | (46.7)     | (48.8)  | (8.6) |

Note: percentages will total more than 100 due to multiple responses per respondent

*Teachers most need additional staff development in the area of*

Directors of instruction, principals, and teachers were asked what areas of staff development teachers needed most. Directors of instruction (62.5%) responded that teachers most need additional staff development in math. Twenty-five percent of the directors of instruction indicated teachers most need staff development in working with At-Risk youth. The two greatest perceived needs of staff development for teachers according to principals were in the areas of working with At-Risk youth (34.2%) and math (28.9%). The greatest need for staff development according to teachers was in the areas of technology (22.5%) and working with At-Risk youth (21.4%). Overall, the most needed areas of staff development for teachers as indicated by all respondents were working with At-Risk youth (24.3%) and technology (18.8%). All respondents to this item indicated that working with At-Risk youth was an area of needed staff development for teachers.

Table 4.15  
*Responses to Survey Questions I10, P13, T13. Teachers most need additional staff development in the area of:*

|   | Math   | Science | Social<br>Studies | Reading | English | Technol<br>ogy | “At-<br>Risk” | Other  | Total |
|---|--------|---------|-------------------|---------|---------|----------------|---------------|--------|-------|
| Director/Assistant<br>Superintendent<br>for Instruction | 5      |         |                   | 1       |         |                | 2             | 1      | 8     |
| %   | (62.5) |         |                   | (12.5)  |         |                | (25.0)        |        | (100) |
| Principals  | 22     | 4       |                   | 9       | 2       | 6              | 26            | 7      | 76    |
| %   | (28.9) | (5.3)   |                   | (11.8)  | (2.6)   | (7.9)          | (34.2)        | (9.3)  | (100) |
| Teachers  | 27     | 20      | 16                | 39      | 14      | 59             | 56            | 31     | 262   |
| %   | (10.3) | (7.6)   | (6.1)             | (14.9)  | (5.3)   | (22.5)         | (21.4)        | (11.9) | (100) |
| Total   | 54     | 24      | 16                | 49      | 16      | 65             | 84            | 38     | 346   |
| %   | (15.6) | (6.9)   | (4.7)             | (14.2)  | (4.6)   | (18.8)         | (24.3)        | (10.9) | (100) |

*Teachers also need staff development in other areas*

All groups of respondents were given the opportunity to indicate in what other areas teachers need staff development. These items (S10, I9, P12, and T12) were open ended in each of the four survey instruments used. Superintendents who responded to this item indicated administration, adult literacy, serving alternative students, physical education, and library media as other areas of needed staff development for teachers. Directors of instruction who responded to this item indicated reading, English as a second language, and differentiation of instruction as other areas of needed staff development for teachers. Principals who responded to this item most often indicated bullying, classroom management, differentiated instruction, English as a second language, inclusion, and reading as other areas of needed staff development. Teacher who responded to this item most often indicated behaviour management, working with students with disabilities, classroom management, English as a second language, inclusion, music, reading, use of smart boards, and student motivation as other areas of needed staff development for teachers.

There appeared to be a general agreement between directors of instruction, principals, and teachers for the need for additional staff development in the areas of English as a second language, reading, and working with students with disabilities. All three of these groups specifically enumerated English as a second language and reading in their open ended responses as areas of needed staff development. Working with students with disabilities appeared to be an area of needed staff development as perceived by these three groups. Directors of instruction and principals used terms associated with working with students with disabilities such as differentiation of instruction and inclusion when describing other areas of needed staff development. Teachers specifically listed working with students with disabilities as an area of need.

*Teachers need access to graduate programs in the area of:*

Superintendents were asked to indicate which graduate programs teachers need access. Superintendents responded that teachers need access to special education (87.5%) and math (87.5%) graduate programs the most. Teacher access to graduate programs in speech therapy was the second (75%) most indicated area of need. Access to graduate programs in administration and supervision (63.5%) and science (63.5%) were the third most indicated areas of need as related to teacher access to graduate programs. The need for graduate programs in special education as perceived by superintendents coincides with the need for staff development in working with students with disabilities as perceived by directors of instruction, principals, and teachers as discussed previously on items S10, I9, P12, and T12. The need for graduate programs in math as perceived by superintendents coincides with the need for math staff development as perceived by directors of instruction and principals and to a lesser extent by teachers as previously discussed on items S2, I2, P3, and T3.

Table 4.16

*Responses to Survey Question S12. "Teachers in my school division need improved access to higher education for the purposes of graduate programs in the area of (choose all that apply*

| Response                       | <u>n</u> | %    |
|--------------------------------|----------|------|
| Curriculum & Instruction       | 4        | 50   |
| Administration and supervision | 5        | 63.5 |
| Speech Therapy                 | 6        | 75   |
| Psychology                     | 1        | 12.5 |
| Math                           | 7        | 87.5 |
| Science                        | 5        | 63.5 |
| Social Studies                 | 2        | 25   |
| English                        | 2        | 25   |
| Arts                           | 0        | 0    |
| Vocational Education           | 2        | 25   |
| Early Childhood Education      | 0        | 0    |
| Special Education              | 7        | 87.5 |
| Other                          | 3        | 37.5 |

Note: percentages will total more than 100 due to multiple responses per respondent

*Teachers want access to graduate programs*

Sixty-six percent of teachers (N=262) responded they either strongly agreed or agreed that they would like improved access to higher education for the purpose of graduate programs. Only 8% of teachers disagreed or strongly disagreed with the desire to have access to graduate programs.

However, many teachers (25.2%) were neutral in their response relative to their desire to have access to graduate programs.

Table 4.17

*Responses to Survey Question T25. “I would like improved access to higher education for the purposes of graduate programs.”*

|          | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | Total |
|----------|-------------------|--------|---------|----------|----------------------|-------|
| Teachers | 92                | 81     | 68      | 15       | 6                    | 262   |
| %        | (35.1)            | (30.9) | (26.0)  | (5.7)    | (2.3)                | (100) |

*Administrators need access to graduate programs*

All of the superintendents agreed administrators need improved access to higher education for the purposes of graduate programs (Ed.S., Ed.D, or Ph.D.). However, only 53.9% principals strongly agreed or agreed that administrators have this need. Nearly a third (28.9%) of principals did not have an opinion with respect to this possible perceived need. Only 13.2% of principals either disagreed or strongly disagreed that administrators need improved access to graduate programs.

Table 4.18

*Responses to Survey Questions S14, P27. Administrators need improved access to higher education for the purposes of graduate programs (Ed.S., Ed.D., Ph.D.).*

|                 | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | Total |
|-----------------|-------------------|--------|---------|----------|----------------------|-------|
| Superintendents |                   | 8      |         |          |                      | 8     |
| %               |                   | (100)  |         |          |                      | (100) |
| Principals      | 20                | 21     | 25      | 8        | 2                    | 76    |
| %               | (26.3)            | (27.6) | (33.0)  | (10.5)   | (2.6)                | (100) |
| Total           | 20                | 29     | 25      | 8        | 2                    | 84    |
| %               | (23.8)            | (34.5) | (29.8)  | (9.5)    | (2.4)                | (100) |

*Administrators need staff development in the area of:*

All superintendents responded that administrators need staff development in the area of evaluating instruction. Superintendents (75%) also responded that administrators need staff development in special education. Additionally, 62.5% of superintendents indicated administrators need staff development in classroom use of technology. Special education was indicated most often by principals (43.4%) as an area of needed staff development for administrators. School law, evaluating instruction, and administrative use of technology all tied as the second most (35.5%) indicated areas of needed staff development for administrators. Overall, both groups indicated most often the need for administrative staff development in the areas of special education (46.4%) and evaluating instruction (41.7%).

Table 4.19

*Responses to Survey Questions S13, P26. Administrators need staff development in the area of (choose all that apply) :*

|                 | School Law | School Finance | Evaluating Instruction | Special Education | NCLB   | Classroom Use of Technology | Administrative use of Technology | Other  |
|-----------------|------------|----------------|------------------------|-------------------|--------|-----------------------------|----------------------------------|--------|
| Superintendents | 4          | 2              | 8                      | 6                 | 1      | 5                           | 3                                | 1      |
| %               | (50)       | (25)           | (100)                  | (75)              | (12.5) | (62.5)                      | (37.5)                           | (12.5) |
| Principals      | 27         | 19             | 27                     | 33                | 24     | 19                          | 27                               | 4      |
| %               | (35.5)     | (25)           | (35.5)                 | (43.4)            | (31.6) | (25)                        | (35.5)                           | (5.3)  |
| Total           | 31         | 21             | 35                     | 39                | 25     | 24                          | 30                               | 5      |
| %               | (36.9)     | (25)           | (41.7)                 | (46.4)            | (29.8) | (28.6)                      | (35.7)                           | (6.0)  |

Note: percentages will total more than 100 due to multiple responses per respondent

*Teachers want information on existing educational programs and resources*

Principals (77.6%) most often indicated teachers would like information on existing educational programs in the area of math. Teachers (46.6%) however most often indicated they would like information on existing educational programs in the area of reading. Principals (60.5%) were in agreement with teachers with respect to a desire of teachers for information on existing educational programs in the area of reading. Principals (64.5%) next most often indicated teachers would like information on existing educational programs in the area of science. A desire for information on existing educational programs in the area of writing (34.7%) was next most often indicated by teachers. Principals (60.5%) were in agreement with teachers with respect to a desire of teachers for information on existing educational programs in the area of writing. The cumulative total of these two groups of educators indicate reading (49.7%) and math (43.8%) as the areas teachers would most like to have information on existing educational programs and resources. Overall, more than 35% of all participants indicated teachers would like information on existing educational programs in each core academic area.

Table 4.20

*Responses to Survey Questions P25, T24. Teachers would like information on existing educational programs and resources in these subjects (check all that apply):*

|            | Math   | Science | Reading | Writing | Other  |
|------------|--------|---------|---------|---------|--------|
| Principals | 59     | 49      | 46      | 46      | 4      |
| %          | (77.6) | (64.5)  | (60.5)  | (60.5)  | (5.3)  |
| Teachers   | 89     | 73      | 122     | 91      | 38     |
| %          | (34.0) | (27.9)  | (46.6)  | (34.7)  | (14.5) |
| Total      | 148    | 122     | 168     | 137     | 42     |
| %          | (43.8) | (36.1)  | (49.7)  | (40.5)  | (12.4) |

Note: percentages will total more than 100 due to multiple responses per respondent

*Teachers need staff development in content areas this is designed to:*

Directors of instruction most often responded (50%) that teachers need staff development in content areas that is designed to enable students to better perform on Standards of Learning tests.

Directors of instruction next most often responded (37.5%) that teachers need staff development in content areas that is designed to enable teachers to more effectively deliver math instruction.

Table 4.21

*Responses to Survey Question III. Teachers need staff development in content areas that is designed to:*

|   | Enable<br>teachers to<br>gain<br>content<br>knowledge | Effectively<br>deliver<br>math<br>instruction | Better<br>perform<br>on SOL<br>tests | Integrate<br>technology<br>into<br>instruction | Meet<br>highly<br>qualified<br>standards | Other | Total |
|---|---|---|--------------------------------------|--|--|-------|-------|
| Director/Assistant<br>Superintendent<br>for Instruction | 1   | 3   | 4                                    |  |  |       | 8     |
| %   | (12.5)  | 37.5)   | (50.0)                               |  |  |       | (100) |
| Total   | 1   | 3   | 4                                    |  |  |       | 8     |
| %   | (12.5)  | (37.5)  | (50.0)                               |  |  |       | (100) |

*Teachers most need staff development in content areas this is designed to:*

Principals and teachers were in agreement on the design of staff development. Principals (44.7%) and teachers (40.0%) both most often responded that teachers most need staff development in content areas that is designed to enable teachers to more effectively deliver math instruction. Principals (37.5%) and teachers (23.3%) next most often responded that teachers need staff development in content areas that is designed to enable students to better perform on Standards of Learning tests. Principals (10.5%) and teachers (18.8%) third most often responded that teachers need staff development in content areas that is designed to better integrate technology into instruction.

Table 4.22

*Responses to Survey Questions P14, T14. Teachers most need staff development in content areas that is designed to:*

|            | Enable<br>teachers to<br>gain<br>content<br>knowledge | Effectively<br>deliver<br>math<br>instruction | Better<br>perform<br>on SOL<br>tests | Integrate<br>technology<br>into<br>instruction | Meet<br>highly<br>qualified<br>standards | Other | Toatal |
|------------|---|---|--------------------------------------|--|--|-------|--------|
| Principals |   | 34  | 24                                   | 8  | 4  | 6     | 76     |
| %          |   | (44.7)  | (31.6)                               | (10.5)   | (5.3)                                    | (7.9) | (100)  |
| Teachers   | 13  | 98  | 57                                   | 46   | 16                                       | 15    | 245    |
| %          | (5.3)   | (40.0)  | (23.3)                               | (18.8)   | (6.5)                                    | (6.1) | (100)  |
| Total      | 13  | 132   | 81                                   | 54   | 20                                       | 21    | 321    |
| %          | (4.0)   | (41.1)  | (25.2)                               | (16.8)   | (6.2)                                    | (6.5) | (100)  |

*Teachers need staff development in technology for the purpose of:*

Principals and teachers were in general agreement on the needed purposes of technology staff development for teachers. Principals (75%) most often responded that teachers need staff development in technology for the purpose of using hardware to better deliver instruction. Principals (69.3%) next most often responded that teachers need staff development in technology for the purpose of using the internet to better deliver instruction. Teachers responded in much the same way as principals as to their perceived needs for technology staff development. Teachers (56.5%) most often responded that they need staff development in technology for the purpose of using the internet to better deliver instruction. Teachers (55.7%) next most often responded they need staff development in technology for the purpose of using hardware to better deliver instruction. Both principals (48.7%) and teachers (32.4%) indicated teachers need staff development in technology for the purpose of designing web sites the third most often.

Table 4.23

*Responses to Survey Questions P9, T9. Teachers need staff development in technology for the purpose of (choose all that apply):*

|            | Using hardware to better deliver instruction | Using the internet to better deliver instruction | Using productivity software such as Microsoft Office | Designing web sites | Other |
|------------|--|--|--|---------------------|-------|
| Principals | 57   | 52   | 22   | 37                  | 5     |
| %          | (75.0)                                       | (69.3)   | (28.9)   | (48.7)              | (6.6) |
| Teachers   | 146  | 148  | 70   | 85                  | 23    |
| %          | (55.7)                                       | (56.5)   | (26.7)   | (32.4)              | (8.8) |
| Total      | 203  | 200  | 92   | 122                 | 28    |
| %          | (60.1)                                       | (59.2)   | (27.2)   | (36.1)              | (8.3) |

Note: percentages will total more than 100 due to multiple responses per respondent

*Teachers most need staff development in technology for the purpose of:*

Principals and teachers responded in the same way as to their most perceived needs for technology staff development. Principals (44.3%) and teachers (37.0%) indicated teachers most need staff development in technology for the purpose of using hardware to better deliver instruction. Principals (30.0%) and teachers (30.4%) indicated teachers next most need staff development in technology for the purpose of using the internet to better deliver instruction. The third most indicated area of need for teacher technology staff development by both principals (15.7%) and teachers (12.6%) was for the purpose of designing web sites.

Table 4.24

*Responses to Survey Questions P10, T10. Teachers most need staff development in technology for the purpose of :*

|            | Using hardware to better deliver instruction | Using the internet to better deliver instruction | Using productivity software such as Microsoft Office | Designing web sites | Other  | Total |
|------------|--|--|--|---------------------|--------|-------|
| Principals | 31   | 21   | 1  | 11                  | 6      | 70    |
| %          | (44.3)                                       | (30.0)   | (1.4)  | (15.7)              | (8.6)  | (100) |
| Teachers   | 85   | 70   | 21   | 29                  | 25     | 230   |
| %          | (37.0)                                       | (30.4)   | (9.1)  | (12.6)              | (10.9) | (100) |
| Total      | 116  | 91   | 22   | 40                  | 31     | 300   |
| %          | (38.7)                                       | (30.3)   | (7.3)  | (13.3)              | (10.3) | (100) |

Means of delivering staff development

*Teachers would take advantage of web-based educational opportunities*

Superintendents (87.5%) agreed that teachers would take advantage of web-based educational opportunities if they were available. The remaining 12.5% did not have an opinion relative to this item.

Table 4.25

*Responses to Survey Question 11. “Teachers in my school division would take advantage of web-based educational opportunities.”*

|                 | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | Total |
|-----------------|-------------------|--------|---------|----------|----------------------|-------|
| Superintendents |                   | 7      | 1       |          |                      | 8     |
| %               |                   | (87.5) | (12.5)  |          |                      | (100) |

*Teachers would take advantage of web-based staff development opportunities*

Principals (65.8%) either strongly agreed or agreed that delivery of staff development opportunities via a web-based method would be a very feasible method of delivery. Teachers (69.4%) either strongly agreed or agreed that delivery of staff development opportunities via a web-based method would be the most feasible method of delivery. The agreement between teachers and principals on the perceived feasibility for teachers to take advantage of web-based staff development opportunities is in keeping with the superintendents' response to such feasibility as previously discussed on item S11. Twenty percent of teachers and principals had no opinion on the feasibility of staff development delivered via a web-based method. Ten percent of teachers and principals disagreed with the feasibility of staff development delivered via a web-based method.

Table 4.26

*Responses to Survey Questions P24, T23. Web based staff development would be very (P) or most (T) feasible.*

|            | Strongly<br>Agree | Agree  | Neutral  | Disagree | Strongly<br>Disagree | Total |
|------------|-------------------|--------|----------|----------|----------------------|-------|
| Principals | 19                | 31     | 17       | 9        |                      | 76    |
| %          | (25.0)            | (40.8) | (22.317) | (11.8)   |                      | (100) |
| Teachers   | 80                | 102    | 55       | 25       |                      | 262   |
| %          | (30.5)            | (38.9) | (21.0)   | (9.5)    |                      | (100) |
| Total      | 99                | 133    | 72       | 34       |                      | 338   |
| %          | (29.3)            | (39.3) | (21.3)   | (10.1)   |                      | (100) |

*Feasibility of going to the research center for staff development*

Principals (67.1%) indicated it would be very feasible for staff to attend development opportunities at the research center if the staff development were offered during the summer. The next most feasible time according to principals (59.2%) for staff to attend development opportunities at the research center would be during the workday. The third most feasible time according to principals (31.6%) for staff attending development opportunities at the research center was after school hours but during the school year. Teachers indicated the feasibility of attending staff development opportunities at the research center in much the same manner as principals. Teachers (54.6%) however, indicated attending staff development opportunities at the research center would be very feasible if the staff development were offered during the workday. Teachers (47.7%) indicated attending staff development opportunities at the research center during the summer as the next most feasible time for such staff development. Thirdly, teachers (29.4%) indicated it would be very feasible to attend the research center for staff development after school but during the school year.

Table 4.27

*Responses to Survey Questions P23, T22. It would be feasible to go to the research center if staff development were offered (choose all that apply):*

|            | During the<br>workday | After school<br>but during the<br>school year | During the<br>summer | During the<br>weekend |
|------------|-----------------------|---|----------------------|-----------------------|
| Principals | 45                    | 24  | 51                   | 17                    |
| %          | (59.2)                | (31.6)  | (67.1)               | (22.4)                |
| Teachers   | 143                   | 77  | 125                  | 35                    |
| %          | (54.6)                | (29.4)  | (47.7)               | (13.4)                |
| Total      | 188                   | 101   | 176                  | 52                    |
| %          | (55.6)                | (29.9)  | (52.1)               | (15.4)                |

Note: percentages will total more than 100 due to multiple responses per respondent

### Communication with the Research Center

#### *Visits to the research center*

A minority of all respondents (25.1%) have visited the research center. Superintendents (25%), directors of instruction (37.5%), principals (31.6%), and teachers (22.5%) indicated they had visited the research center.

Table 4.28

*Responses to Survey Question S19, I14, P28, T26 . “I have visited the research center.”*

|                    | Yes    | No     | Total |
|--------------------|--------|--------|-------|
| Superintendents    | 2      | 6      | 8     |
| <i>n</i> = 8       | (25.0) | (75.0) | (100) |
| Director/Assistant | 3      | 5      | 8     |
| Superintendents of |        |        |       |
| Instruction        |        |        |       |
| %                  | (37.5) | (62.5) | (100) |
| Principals         | 24     | 52     | 76    |
| %                  | (31.6) | (68.4) | (100) |
| Teachers           | 59     | 200    | 259   |
| %                  | (22.5) | (76.3) | (100) |
| Total              | 88     | 263    | 351   |
| %                  | (25.1) | (74.9) | (100) |

*Direct Communication with the research center*

Half of both superintendents and directors of instruction indicated they have had direct communication with the research center. Conversely, half of all superintendents and directors of instruction indicated they have not had direct communication with the research center.

Table 4.29

*Responses to Survey Question S20, I14. "I have had direct communication with the research center."*

|   | Yes    | No     | Total |
|---|--------|--------|-------|
| Superintendents   | 4      | 4      | 8     |
| %   | (50.0) | (50.0) | (100) |
| Director/Assistant<br>Superintendents of<br>Instruction | 4      | 4      | 8     |
| %   | (50.0) | (50.0) | (100) |
| Total   | 8      | 8      | 16    |
| %   | (50.0) | (50.0) | (100) |

*Clear delineation of what the research center is capable of offering*

Most (75%) of superintendents did not have an opinion relative to having a clear delineation of what staff development opportunities the research center was capable of offering their individual school divisions. A equal (12.5%) number of superintendents both agreed with having such a delineation relative to staff development opportunities at the research center and disagreed with having such a delineation relative to staff development opportunities at the research center.

Table 4.30

*Responses to Survey Question S16. “My school division has a clear delineation of what staff development opportunities the research center is capable of offering my school division.”*

|                 | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | Total |
|-----------------|-------------------|--------|---------|----------|----------------------|-------|
| Superintendents |                   | 1      | 6       | 1        |                      | 8     |
| %               |                   | (12.5) | (75.0)  | (12.5)   |                      | (100) |

*Good lines of communication with the research center*

Half of all superintendents responded that their individual school division has good lines of communication with the research center. An equal number of superintendents did not have an opinion relative to the lines of communication between their school division and the research center.

Table 4.31

*Responses to Survey Question S15. “My school division has good lines of communication with the research center in our area.”*

|                 | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | Total |
|-----------------|-------------------|--------|---------|----------|----------------------|-------|
| Superintendents |                   | 4      | 4       |          |                      | 8     |
| %               |                   | (50.0) | (50.0)  |          |                      | (100) |

*I would like to know what the research center can offer*

Directors of instruction (75%), principals (88.2%), and teachers (83.2%) either agreed or strongly agreed that they would like to know what staff development opportunities the research center could offer. Twelve percent of these respondents did not have an opinion relative to a desire to know what staff development opportunities were available at the research center and less than 1% either disagreed or strongly disagreed with wanting such information.

Table 4.32

*Responses to Survey Questions I12, P22, T21. I would like to know what the research center can offer.*

|                                | Strongly Agree | Agree  | Neutral | Disagree | Strongly Disagree | Total |
|--------------------------------|----------------|--------|---------|----------|-------------------|-------|
| Director/Assistant             | 4              | 2      | 2       |          |                   | 8     |
| Superintendents of Instruction |                |        |         |          |                   |       |
| %                              | (50.0)         | (25.0) | (25.0)  |          |                   | (100) |
| Principals                     | 37             | 30     | 8       | 1        |                   | 76    |
| %                              | (48.7)         | (39.5) | (10.5)  | (1.3)    |                   | (100) |
| Teachers                       | 89             | 129    | 42      |          | 2                 |       |
| %                              | (34)           | (49.2) | (13.0)  |          | (.8)              |       |
| Total                          | 130            | 161    | 52      | 1        | 2                 | 346   |
| %                              | (37.6)         | (46.5) | (15.0)  | (.3)     | (.6)              | (100) |

## Input

### *School division has had input*

Half of all directors of instruction did not have an opinion relative to their school division having had input into what the research center can offer their individual school divisions. An equal number (12.5%) of directors of instruction either agreed or disagreed that their school division had such input.

Table 4.33

*Responses to Survey Questions I15. “My school division has had input into what the research center can offer my school division.”*

|   | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | Total |
|---|-------------------|--------|---------|----------|----------------------|-------|
| Director/Assistant<br>Superintendent<br>for Instruction |                   | 2      | 4       | 2        |                      | 8     |
| %   |                   | (25.0) | (50.0)  | (25.0)   |                      | (100) |

*Sufficient input*

Half of the superintendents disagreed that their individual school divisions had sufficient input into what the research center can or cannot offer their school divisions. An equal number of superintendents (25%) either agreed that their school division did have sufficient input into what the research center can or cannot offer or had no opinion.

Table 4.34

*Responses to Survey Question S17. “My school division has sufficient input into what the research center can or cannot offer my school division.”*

|                 | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | Total |
|-----------------|-------------------|--------|---------|----------|----------------------|-------|
| Superintendents |                   | 2      | 2       | 4        |                      | 8     |
| %               |                   | (25.0) | (25.0)  | (50.0)   |                      | (100) |

*I had an opportunity to provide input*

Principals (5.8%) and teachers (9.4%) indicated they had an opportunity to provide input into the staff development offerings provided by the research center. Teachers (55.1%) and principals (60.9%) indicated they did not have an opportunity to provide input into the staff development opportunities provided by the research center. More than 30% of teachers and principals indicated that no staff development had been given by the research center.

Table 4.35

*Responses to Survey Question P19, T18 . “I had an opportunity to provide input into the staff development offerings provided by the research center.”*

|            | Yes   | No     | No staff development given by research center | Total |
|------------|-------|--------|---|-------|
| Principals | 4     | 42     | 23  | 69    |
| %          | (5.8) | (60.9) | (33.3)  | (100) |
| Teachers   | 22    | 129    | 83  | 234   |
| %          | (9.4) | (55.1) | (35.5)  |       |
| Total      | 26    | 171    | 106   | 303   |
| %          | (8.6) | (56.4) | (35.0)  | (100) |

*I would like to express future staff development needs*

Eighty-three percent of principals and 75% of teachers indicated they would like to have an opportunity to express future staff development needs to the research center. The remaining (23.5%) principals and teachers indicated they would not like to have such an opportunity.

Table 4.36

*Responses to Survey Question P21, T20 . I would like to have an opportunity to express future staff development needs*

|                | Yes    | No     | Total |
|----------------|--------|--------|-------|
| Principals     | 60     | 12     | 72    |
| <i>n</i> = 76  | (83.3) | (16.7) | (100) |
| Teachers       | 188    | 64     | 252   |
| <i>n</i> = 262 | (74.6) | (25.4) | (100) |
| Total          | 248    | 76     | 324   |
| N =338         | (76.5) | (23.5) | (100) |

## Effectiveness

*Was the staff development given by the research center effective?*

Principals (32.2%) and teachers (15.7%) either strongly agreed or agreed that the staff development offered by the research center was effective in meeting their needs. Teachers (36.4%) and principals (21.0%) did not indicate an opinion on the effectiveness of staff development offered by the research center. Nearly 45% of both principals and teachers indicated that no staff development had been offered by the research center.

Table 4.37

*Responses to Survey Questions P17, T16. Staff development given by research center was effective in meeting needs.*

|            | Strongly<br>Agree | Agree  | Neutral | Disagree | Strongly<br>Disagree | No staff<br>development<br>offered | Total |
|------------|-------------------|--------|---------|----------|----------------------|------------------------------------|-------|
| Principals | 4                 | 16     | 13      |          |                      | 29                                 | 62    |
| %          | (6.4)             | (25.8) | (21.0)  |          |                      | (46.8)                             | (100) |
| Teachers   | 6                 | 29     | 81      | 6        | 1                    | 100                                | 223   |
| %          | (2.7)             | (13.0) | (36.4)  | (2.7)    | (.4)                 | (44.8)                             | (100) |
| Total      | 10                | 45     | 94      | 6        | 1                    | 129                                | 285   |
| %          | (3.5)             | (15.7) | (33.0)  | (2.1)    | (.4)                 | (45.3)                             | (100) |

### Participation

*The following staff have participated in staff development given by the research center*

Twenty-five percent of superintendents indicated teachers and administrators from their individual school divisions had participated in staff development opportunities given by the research center. Superintendents (37.5%) also indicated that just teachers from their individual school divisions had participated in staff development opportunities given by the research center. Twenty-five percent of superintendents indicated that none of their staff had participated in staff development opportunities given by the research center.

Table 4.38

*Responses to Survey Question S18. “The following staff of my school division have participated in staff development opportunities given at the research center (choose all that apply*

|                 | Teachers and<br>Administrators | Teachers | None of my<br>staff | Total |
|-----------------|--------------------------------|----------|---------------------|-------|
| Superintendents | 2                              | 3        | 2                   | 8     |
| %               | (25.0)                         | (37.5)   | (25.0)              | (100) |

*Teacher participation*

Principals (39.7%) and teachers (16.9%) indicated that teachers have participated in staff development opportunities given by the research center. Principals (35.6%) and teachers (60.5%) also indicated that teachers had not participated in staff development opportunities given by the research center. Teachers and principals combined (20.7%) indicated that no staff development was offered by the research center.

Table 4.39

*Responses to Survey Question P15, T15 . Teachers have participated in staff development given by the research center*

|                | Yes    | No     | No staff<br>development<br>given by<br>research center | Other  | Total |
|----------------|--------|--------|--|--------|-------|
| Principals     | 29     | 26     | 10   | 8      | 73    |
| <i>n</i> = 76  | (39.7) | (35.6) | (13.7)   | (11.0) | (100) |
| Teachers       | 44     | 158    | 59   |        | 261   |
| <i>n</i> = 262 | (16.9) | (60.5) | (22.6)   |        | (100) |
| Total          | 73     | 184    | 69   | 8      | 334   |
| N =338         | (21.9) | (55.1) | (20.7)   | (2.3)  | (100) |

*Teachers have participated in the following staff development given by the research center*

Most (38.2%) of principals indicated that teachers in their buildings had not participated in staff development opportunities provided by the research center. Principals (14.5%) also indicated technology staff development given by the research center was the area in which most teachers had participated followed by science (11.8%), and math (7.9%).

Table 4.40

*Responses to Survey Question P16. “The research center has offered staff development for teachers in my building in the area(s) of (choose all that apply). ”*

| Response                          | <u>n</u> | %    |
|-----------------------------------|----------|------|
| Math                              | 6        | 7.9  |
| Science                           | 9        | 11.8 |
| Social Studies                    | 1        | 1.3  |
| Reading                           | 1        | 1.3  |
| English                           | 0        | 0    |
| Technology                        | 11       | 14.5 |
| Working with “At-Risk” youth      | 1        | 1.3  |
| My teachers have not participated | 29       | 38.2 |
| Other                             | 8        | 10.5 |

*Reasons for non-participation*

All groups of respondents were given the opportunity to indicate reasons for staff not participating in staff development opportunities given by the research center. These items (S21, I16, P18, and T17) were open ended in each of the four survey instruments used.

Superintendents who responded indicated distance to the research center and uncertainty of available opportunities as other reasons their staff had not participated in development opportunities given by the research center. Directors of instruction who responded were in agreement with superintendents as to other reasons their staff had not participated in staff development opportunities given by the research center. Principals who responded indicated availability of offerings, lack of information from the research center on available offerings, and teacher schedule conflicts as other reasons teachers were prevented from participating in staff development opportunities given by the research center. Teachers who responded to this item indicated teacher schedule conflicts, distance to the research center, lack of knowledge of the staff development offerings, and no staff development opportunities were given by the research center as other reasons they had not participated in staff development opportunities given by the research center.

## CHAPTER FIVE

The purpose of this study was to determine the perceived needs of K – 12 educators in the service region of the IALR in Southside Virginia. This chapter will summarize the findings of the study, present a discussion of the concerns of the study, provide recommendations for further research, and finally present implications for practice.

### Summary

The findings of the study will be summarized by six areas: (1) the perceived needs of K – 12 educators in the service region of the IALR located in Southside Virginia relative to staff development and continuing education for teachers and administrators, (2) possible means of delivering such staff development and continuing education opportunities by the research center, (3) the communication school divisions have had with the research center, (4) the input school divisions have had into the staff development opportunities given by the research center, (5) the perceived effectiveness of the staff development that has been given by the research center, and (6) the participation of educators in the staff development that has been offered by the research center.

### *Perceived needs of K-12 educators in Southside Virginia*

As previously described, not all participants were asked to respond to the same items in each of the four instruments used. Items were directed to the individuals most likely to have the knowledge to answer the item. Summarizing the agree or strongly agree responses from all respondents relative to perceived need for teacher staff development revealed the following. (1) Superintendents most often indicated (in decreasing order) teachers need staff development in the areas of special education, science, and math. (2) Directors of instruction most often indicated (in

decreasing order) teachers need staff development in the areas of math, reading, science, technology, and working with At-Risk youth. (3) Principals most often indicated (in decreasing order) teachers need staff development in the areas of working with At-Risk youth, math, technology, and reading. (4) Teachers most often indicated (in decreasing order) they need staff development in technology, working with At-Risk youth, and reading. These data are summarized in tables 5.1 – 5.3. These perceived needs are supported by table 4.15 in which directors of instruction, principals, and teachers indicated the greatest need for teacher staff development respectfully as math, working with At-Risk youth, and technology. Table 4.16 confirms the superintendents' perceptions regarding the need teachers have for staff development in special education, math, and science through access to graduate programs in these areas. The perceived need for access to graduate programs was expressed by teachers (66%), superintendents (100%), and principals (53.9%). Superintendents most often expressed the need for staff development in evaluating instruction (100%) for administrators while principals most often (43.4%) responded they needed staff development in the area of special education.

Directors of instruction, principals and teachers most often indicted (in decreasing order) teachers need staff development in content areas that is designed to allow teachers to effectively deliver math instruction and to increase Standard of Learning (SOL) test scores. Principals and teachers responded that teachers need staff development in technology, which was the teachers' most perceived need, that is designed to allow teachers to learn how to use the internet and hardware to better deliver instruction.

Table 5.1

*Summary (S, I, P, T) of Teacher Need Responses.*

|   | Agree or Strongly<br>Agree Math | Agree or Strongly<br>Agree Science | Agree or<br>Strongly Agree<br>Social Studies | Agree or<br>Strongly Agree<br>English |
|---|---------------------------------|------------------------------------|--|---------------------------------------|
| Superintendents   | 7                               | 8                                  | 6  | 6                                     |
| %   | (87.5)                          | (100)                              | (75)   | (75)                                  |
| Director/Assistant<br>Superintendents of<br>Instruction | 8<br>(100)                      | 7<br>(87.5)                        | 5<br>(62.5)                                  | 6<br>(75)                             |
| %   |                                 |                                    |  |                                       |
| Principals  | 63                              | 58                                 | 43   | 44                                    |
| %   | (82.8)                          | (76.3)                             | (56.6)                                       | (57.9)                                |
| Teachers  | 115                             | 117                                | 107  | 141                                   |
| %   | (43.9)                          | (44.7)                             | (40.8)                                       | (53.8)                                |
| Total   | 193                             | 190                                | 161  | 197                                   |
| %   | (54.5)                          | (53.7)                             | (45.5)                                       | (55.6)                                |

Table 5.2

*Summary (S) of Teacher Need Responses.*

|                 | Agree or Strongly<br>Agree Arts | Agree or Strongly<br>Agree Career &<br>Tech. | Agree or<br>Strongly Agree<br>Early Childhood<br>Ed. | Agree or<br>Strongly Agree<br>Special Ed. |
|-----------------|---------------------------------|--|--|---|
| Superintendents | 3                               | 6  | 5  | 8   |
| %               | (37.5)                          | (75)   | (62.5)   | (100)                                     |

Table 5.3

*Summary (I, P, T) of Teacher Need Responses*

|                                   | Agree or Strongly<br>Agree Technology | Agree or Strongly<br>Agree Reading | Agree or Strongly<br>Agree At-Risk |
|-----------------------------------|---------------------------------------|------------------------------------|------------------------------------|
| Director/Assistant                | 7                                     | 8                                  | 7                                  |
| Superintendents of<br>Instruction |                                       |                                    |                                    |
| %                                 | (87.5)                                | (100)                              | (87.5)                             |
| Principals                        | 59                                    | 56                                 | 70                                 |
| %                                 | (77.6)                                | (73.7)                             | (92.1)                             |
| Teachers                          | 193                                   | 162                                | 190                                |
| %                                 | (73.7)                                | (61.8)                             | (72.5)                             |
| Total                             | 259                                   | 226                                | 267                                |
| %                                 | (74.9)                                | (65.3)                             | (77.2)                             |

*Means of delivering staff development*

The majority of superintendents (84.5%), principals (65.8%), and teachers (69.4%) agreed or strongly agreed that teachers would take advantage of web based staff development opportunities. Fewer principals and teachers indicated it would be feasible to go to the research center at anytime than to have staff development opportunities presented via the internet.

*Communication with the research center*

A minority (24.9%) of K – 12 educators within the service region of the IALR indicated they had visited the research center while half of the superintendents indicated they have had direct communication with the research center and felt they had good lines of communication with the research center. A majority of directors of instruction (75%), principals (88.2%), and teachers (83.2%) indicated they would like to know what the research center can offer.

*Input*

A minority of directors of instruction (25%), principals (5.3%), and teachers (8.4%) indicated either their school division or they had input into what staff development the research center had offered. Superintendents (25%) agreed their school division had sufficient input into what the research center could or could not offer their division. Paradoxically, most principals (78.9%) and teachers (71.8%) indicated they would like the opportunity to express their future staff development needs to the research center.

*Effectiveness*

A minority of principals (26.4%) and teachers (13.4%) indicated the staff development that had been offered by the research center was effective in meeting their needs. A greater percentage of these two groups (38.2%) indicated that no staff development had been offered by the research center.

*Participation*

A majority of superintendents (62.5%) indicated some of their staff had participated in staff development given by the research center. A minority of principals (38.2%) and teachers (16.8%) however, indicated teachers had participated in such staff development opportunities. Technology (14.5%) and science (11.8%) were the areas most often indicated as staff development provided by the research center. Reasons staff had not participated in development opportunities given by the research center, barring schedule conflicts, included a perceived lack of pertinent communication with the research center and the distance between the research center and school divisions.

## Discussion

Concerns that surfaced during the study included differing response rates of participants, differing perceptions of needs, and resistance to completing the study. A concern of participants that emerged as data were analyzed was the overall perceived lack of communication between the research center and the school divisions. This appeared to be a common theme among many respondents of all groups of participants.

The response rates of superintendents and directors of instruction was 100%. The letter of introduction sent to superintendents and follow up letters and telephone calls to the directors may have been responsible for this high rate of return. The response rate for principals was 70.4%. This response rate was achieved after follow up e-mails, letters, and personal telephone calls. This response rate may have been increased if personal telephone calls had been made to each principal. Methods used to increase the response rate of teachers included personal e-mails to colleagues known by the researcher who worked in the school divisions within the study area and e-mails to teachers within the study area who had e-mail addresses posted on their school divisions' web site. The low response rate of teachers however is a noted weakness for the results of this group of participants. Reasons for this low response rate by teachers may include too much reliance on principals to forward participation information to teachers as noted in the study design, teachers may have less access to the internet, or are less motivated to participate in research than the other groups of participants. This noted weakness may be less of a concern to the overall study in determining the general perceived needs of K – 12 educators in the service region of the IALR because teachers do not plan staff development. The response rate of superintendents and directors of instruction, those more likely to plan staff development opportunities between school divisions

and the IALR, and principals, those more likely to express staff development needs to the division level however, were much higher as noted above. Nevertheless, the response of teachers to their staff development needs mirrored those of the principals, which would indicate that personnel in the individual schools might be more knowledgeable about the staff needs than other groups of respondents.

It may be reasonable to assume respondents completed survey instruments based up on the scope of their individual responsibilities. Therefore, since superintendents and assistant superintendents/directors of instruction are responsible for an entire school division, their individual responses to survey instruments would indicate an overall division need. Collectively, these responses would indicate the needs of the service region of the IALR. Their potential lack of daily contact with students and teachers however, may predispose them to a curricular focus relative to staff development needs in the service region of the IALR as indicated in the summary data above. Principals and teachers on the other hand have responsibilities to individual schools and classrooms, consequently the scope of their K – 12 experiences is centered on daily contact with the students in the service region of the IALR. These differences in student contact and the scope of responsibilities between division level educators and school based educators may illustrate the need to provide staff development geared toward meeting the perceived curricular needs of teachers by division level educators, such as math, science, and special education staff development, with the perceived needs of teachers as indicated by school level educators, such as working with At-Risk youth and technology staff development. Such a synergistic approach to developing staff development for the service region of the IALR may find topics such as using technology to teach

math and science to At-Risk children and students with disabilities to be very effective in meeting the needs of all K – 12 educators within the service region of the IALR.

Initially the IALR was accepting of the study. The researcher was in direct communication with the director of the IALR prior to completing the study design and received his support for the study. Once the letters of introduction and sample survey instruments were mailed to the superintendents of the school divisions within the service region of the IALR, however, resistance to the study was expressed by other staff members of the IALR. The staff of the IALR based their objection to the study on their lack of funding and staff with which to provide staff development opportunities as well as their desire to not be responsible for providing these staff development opportunities (N. Franklin, personal communication, August 25, 2006). The researcher and most likely the study participants were well aware of the larger mandate placed on school divisions for providing for their own staff development rather than relying on outside sources such as the IALR. Virginia Department of Education data relative to school funding of the eight school divisions served by the IALR as compared to the total funding provided the IALR would no doubt provide evidence of this supposition. Eventually, the survey instruments were redesigned to abrogate the IALR's concern. The new instruments received approval from the Institutional Review Board of Virginia Tech and the study proceeded. Initially creating the survey instruments in conjunction with the IALR may have prevented the resistance shown by staff members of the IALR, but on the other hand might also have skewed the study to eliminate any reference to the IALR.

As noted earlier, the IALR was primarily established as a means of revitalizing an economically depressed area. Education of the citizenry of Southside is one of the pillars supporting the goal of this revitalization. To this end the 2002 Code of Virginia specifies the following purpose for the IALR:

Expand access to higher education in Southside Virginia by providing for adult and continuing education, workforce training and development, and degree-granting programs, including undergraduate, graduate and professional programs, through partnerships with the Commonwealth's private and public institutions of higher education, the City of Danville, County of Pittsylvania, the public schools, and the public and private sectors in the region (Code of Virginia Chapter 23 §231.19).

The enumeration of public schools in this piece of legislation appears to highlight the importance of the public schools in providing for the education of its citizens. If the IALR is to provide for the continuing education of Southside as noted above, then it is logical to assume the first place to begin would be with the public schools in the areas served by the IALR. After all, K – 12 students from the area served by the IALR who would eventually take advantage of undergraduate graduate programs noted above will come from the public schools of these areas. Partnerships with the public schools in providing for the needed staff development as noted in this study would seem to be a means of ensuring those who matriculate into programs sponsored by the IALR would have the requisite educational base from which to build.

The lack of funding to provide staff development for the school divisions served by the IALR appears to be in conflict with its purpose as noted above. The addition of adequate funding to provide this staff development may be a necessary part of the IALR's budget if it is to realize its ultimate goal of revitalizing this economically distressed area through the education of its citizenry. Support for such increased funding must come from the legislators in the General Assembly in order for the IALR to properly address the stated purposes of providing extended educational opportunities for the children and adults of the region.

### Recommendations for Further Research

Once the study was completed, the following recommendations for further research emerged.

1. This study examined the perceived needs K -12 educators in the service region of one research center located in an economically deprived area of one state. Given the increasing number of research centers, as noted earlier, additional studies designed to assess the perceived needs other school divisions may have of research centers in other states or regions should be conducted to add to the results of this study. These additional studies may hopefully help paint a more robust picture of the needs K-12 schools have of research centers.
2. This study examined the perceived needs of all eight school divisions served by the IALR. Studies designed to examine the needs of individual school divisions or perhaps the needs specific to just the elementary, middle, or high school levels of all of the school divisions may provide data to be used in tailoring staff development for a specific school division or level of educator within the service region of the IALR.
3. This study brought to light the perceived needs of K – 12 educators in the service region of the IALR. These needs may also be met by resources other than the IALR. Research into these resources should be explored.

### Implications for Practice

1. This study collected data on the perceived needs of school divisions within the service area of the IALR. These school divisions have the potential of working collectively to meet their mutual needs as identified by this study. School divisions also have the potential of taking this study's data to develop priority areas of staff development to be discussed with the IALR or other resources within the area that are capable of meeting their needs.
2. The necessary relationship characteristics found in the literature between research centers and business emphasise communication as a fundamental component needed for an effective partnership. Using the existing literature to examine extending this relationship to include a partnership between K – 12 public schools and research centers would highlight the importance of communication in this partnership as well. Data collected from this study indicate school divisions within the service region of the IALR do not perceive such communication exists. Staffs of these school divisions are desirous of having communication with the IALR to provide input into what staff development and continuing education is offered. An effort to increase communication between the school divisions served by the IALR and the IALR should be made.
3. This study found evidence that the delivery of web-based staff development was not only desirable but also feasible. This evidence provides the IALR with the opportunity to combine its focus of broadband technology for the region with meeting the needs of the school divisions it serves.
4. The inclusion of funding for staff development of the K-12 school divisions served by the IALR as noted in the discussion portion of this chapter to address the needs identified in this

study should be considered by those responsible for establishing future budgets of the IALR. Furthermore, once funds are appropriated to deliver such staff development opportunities, the IALR would be well advised to follow the recommendations found in the literature concerning the relationship characteristics of trust and communication between research centers and industry. These characteristics may be applicable to partnerships established between the IALR and the school divisions it serves.

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## Appendix B Letter to Participants

Dear Participant:

In the past few years there have been several attempts to assist in the economic recovery of the people in the Martinsville/Danville areas. One part of that effort has been in providing more educational opportunities for all people in this geographic area. Several institutions of higher education have expanded educational offerings to assist with this problem. One such institution has created a research center to assist with the economic development. Part of this development is to provide more educational opportunities for the advancement of all individuals. As a result, we feel it is important to identify the needs of the public school sector so that the entire scope of needs can be identified. To this end we are asking you to participate in a needs survey of the school divisions in this geographic region. We think we have a unique way of having you take the survey. No papers, no mailing of responses, and assurance that responses are not seen directly by anyone, even the researchers. We have put the survey on-line through the Virginia Tech Web, and you are being asked to participate by using that survey. We think this is a unique way for teachers to respond and hope the ease of taking the survey will interest you.

Participation in this survey is voluntary and by participating you give your consent to gathering data. In addition there is no compensation for participation, except for the fact that you will be doing some good to promote the working conditions of members of the teaching profession. Data from this study will be reported only in group form and no individual response will be able to be identified. In addition the personal demographic data will be used only for analysis and no individual will be able to be identified. Finally, after the study is completed, all data will be destroyed.

Participation in the study will be very simple and direct. The survey instrument is posted on the Virginia Tech Internet Survey Program. You will be able to access the survey instrument through the Internet at your convenience. After reading this notice you can easily complete the survey as it is ready NOW. When you have completed the survey, you will be able to submit your completed survey simply by clicking on **SUBMIT** and the job will be done, no mailings or finding an envelope, or any of the other difficulties in a mail survey. Using the Internet assures the data will not be seen by anyone including ourselves. Only group data will be available from the Internet.

You can use your email access to find the web site. This is done by opening the web site:

[Link](#) to Specific Survey

Directions for completing the survey instrument are provided at the site. Please don't be intimidated by accessing the web site because it is very easy to complete.

Again we want to ask you to participate in the study by completing the survey. We think this research is very important because it can give educators in Southside Virginia an opportunity to express their needs for staff development.

Thank you.

Glen I. Earthman  
Educational Leadership & Policy Studies  
Virginia Tech

Jeff Early  
Ph.D. Candidate  
Virginia Tech

## Appendix C Letter of Introduction to Superintendents

July 30, 2006

Superintendent:

As you may be aware, the Institute for Advanced Learning and Research (IALR) is a joint venture between Virginia Tech, Averett University, Danville Community College, and public and private bodies and organizations of the region and state. The primary purpose of the IALR is to revitalize the economy of Southside Virginia. However, one of its purposes is to provide for needs of educators within its service area. Your school division is within this service area.

We are interested in assessing what needs your school division has of the IALR. Our study is important because it gives you and your staff an opportunity to voice your needs which may be met by the IALR. Our study involves the collection of the perceived needs of superintendents, directors of instruction (or assistant superintendents for instruction), principals, and teacher relative to the IALR. We propose to send administrators a link to an on line survey that should take approximately five minutes to complete. Principals would receive a packet of information sheets for teachers. These information sheets will explain the purpose of the study and provide a link to the teacher survey. Again, this survey should take approximately five minutes to complete. We are enclosing drafts of the survey instruments along with the information sheet for teachers for your review.

We will be happy to share the overall needs of your school division with you. These data may be useful to you as you plan your own division wide staff development activities. We will also be happy to share the findings of the complete study with you.

We would like to begin the study in mid September. Please do not hesitate in contacting us should you have questions regarding our study. You may contact Jeff Early by telephone at (434) 489-2959 or by e-mail at [jbearly@vt.edu](mailto:jbearly@vt.edu). Your assistance in allowing us to complete the study is appreciated.

Sincerely,

Glen I. Earthman  
Professor Emeritus  
Virginia Tech

Jeff Early  
Ph.D. Candidate  
Virginia Tech

## Appendix D Follow up Letter to Principals

November 6, 2006

Recently you received an e-mail soliciting your participation in a worthwhile Virginia Tech study designed to determine the overall staff development needs of Southside school divisions. Thank you for your participation. If you have not yet taken the five minute or less survey, please use the link below to access the principal survey and complete the instrument.

<https://survey.vt.edu/survey/entry.jsp?id=1152196327687>

I will be happy to e-mail you this URL if you will contact me. My telephone number is (434) 489-2959. My e-mail address is [jbearly@vt.edu](mailto:jbearly@vt.edu). I would very much like to capture a representative picture of the needs of all school divisions within this area. Your data is very important to the validity of my study. Your superintendent is aware of the survey and may request a copy of the completed study. I am sure you will want to have your staff needs reflected in this important study. Your assistance in allowing me to complete the study is most appreciated.

The study is designed to determine the perceived staff development needs of educators. Therefore, teacher input is needed. Your assistance in gathering teacher input is vital to the success of this study. The survey is similar to the one to which you responded and should take no more than five minutes to complete. Please simply distribute the teacher information sheet to your staff and ask that they pass it along to other staff members in your building. Please feel free to copy the survey for immediate distribution to your staff.

I thank you in advance for your assistance. Please do not hesitate in contacting me should you have questions regarding this important study.

Sincerely,

Jeff Early  
Ph.D. Candidate  
VA Tech

## Appendix E Superintendent Survey

The partnerships between a major state university, local institutions of higher education, and public and private bodies have resulted in a research center in Southside Virginia. Your school division is within the service area of this research center. Please respond to the items below relative to your staff development needs.

### 1. What school division do you represent?

- Danville
- Franklin
- Halifax
- Henry
- Martinsville
- Mecklenburg
- Patrick
- Pittsylvania

### 2. Teachers in my school division need improved access to higher education for the purposes of continuing education in the area of math.

- Strongly Agree
- Agree
- Neutral

Disagree

Strongly Disagree

**3. Teachers in my school division need improved access to higher education for the purposes of continuing education in the area of science.**

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

**4. Teachers in my school division need improved access to higher education for the purposes of continuing education in the area of social studies.**

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

**5. Teachers in my school division need improved access to higher education for the purposes of continuing education in the area of English.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**6. Teachers in my school division need improved access to higher education for the purposes of continuing education in the area of arts.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**7. Teachers in my school division need improved access to higher education for the purposes of continuing education in the area of career and technical education.**

- Strongly Agree
- Agree
- Neutral
- Disagree

Strongly Disagree

**8. Teachers in my school division need improved access to higher education for the purposes of continuing education in the area of early childhood education.**

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

**9. Teachers in my school division need improved access to higher education for the purposes of continuing education in the area of special education.**

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

**10. Teachers in my school division also need accesses to continuing education in the area of:**

**11. Teachers in my school division would take advantage of web-based educational opportunities.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**12. Teachers in my school division need improved access to higher education for the purposes of graduate programs in the area of (choose all that apply)**

- Curriculum & Instruction
- Administration and supervision
- Speech Therapy
- Psychology
- Math
- Science
- Social Studies
- English
- Arts
- Vocational Education

Early Childhood Education

Special Education

Other (please specify):

**13. Administrators in my school division need additional staff development in the area of**

**(choose all that apply):**

School law

School finance

Evaluating instruction

Special Education

Understanding the implications of NCLB Legislation

Classroom use of technology

Administrative use of technology

Other (please specify):

**14. Administrators in my school division need improved local access to higher education for the purposes of graduate programs (Ed.D., Ed.S., Ph.D.).**

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

**15. My school division has good lines of communication with the research center in our area.**

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

**16. My school division has a clear delineation of what staff development opportunities the research center is capable of offering my school division.**

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

**17. My school division has sufficient input into what the research center can or cannot offer my school division.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**18. The following staff of my school division have participated in staff development opportunities given at the research center(choose all that apply).**

- Teachers
- Administrators
- None of my staff have participated

other (please specify):

**19. I have visited the research center.**

- Yes
- No

**20. I have had direct communication with the research center.**

- Yes
- No

**21. Are there any reason(s) your staff have not participated in staff development opportunities given by the research center? (please specify)**

A large, empty rectangular box with a thin black border. On the right side, there is a vertical scrollbar with a light beige background and a small grey arrow pointing up and down. The box is currently empty, indicating that no text has been entered.

## Appendix F Assistant Superintendent/Director of Instruction Survey

The partnerships between a major state university, local institutions of higher education, and public and private bodies have resulted in a research center in Southside Virginia. Your school division is within the service area of this research center. Please respond to the items below relative to your staff development needs.

### 1. Which school division do you represent?

- Danville
- Franklin
- Halifax
- Henry
- Martinsville
- Mecklenburg
- Patrick
- Pittsylvania

### 2. Teachers in my school division need additional staff development in the area of math.

- Strongly Agree
- Agree
- Neutral
- Disagree

Strongly Disagree

**3. Teachers in my school division need additional staff development in the area of science.**

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

**4. Teachers in my school division need additional staff development in the area of social studies.**

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

**5. Teachers in my school division need additional staff development in the area of reading.**

Strongly Agree

Agree

- Neutral
- Disagree
- Strongly Disagree

**6. Teachers in my school division need additional staff development in the area of English.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**7. Teachers in my school division need additional staff development in the area of technology.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**8. Teachers in my school division need additional staff development in the area of working**

**with "At-Risk" youth.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**9. Teachers in my school division also need staff development in these areas:**

**10. Teachers in my school division most need additional staff development in the area of:**

**(choose one)**

- Math
- Science
- Social Studies
- Reading
- English
- Technology
- Working with "At-Risk" youth
- Other (please specify):

**11. Teachers in my division need additional staff development in content (math, science, social studies, reading, English) areas that is designed (pick one)**

- To enable teachers to gain content knowledge.
- To enable teachers to more effectively deliver math instruction.
- To enable students to better perform on Standards of Learning tests.
- To better integrate technology into instruction.
- To meet highly qualified standards
- Other (please specify):

**12. My school division would like to know what the research center can offer my school division.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**13. I have visited the research center.**

- Yes

No

**14. I have had direct communication with the research center.**

Yes

No

**15. My school division has had input into what the research center can offer my school division.**

Strongly Agree

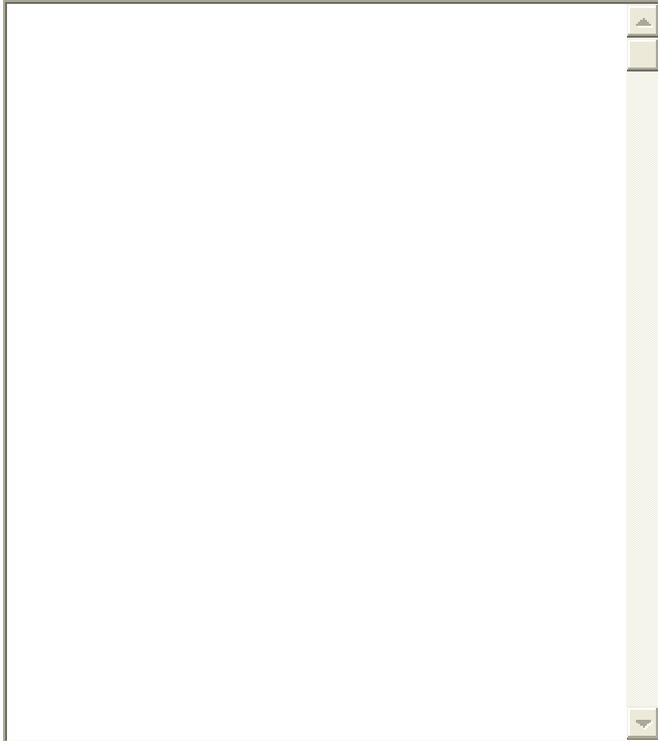
Agree

Neutral

Disagree

Strongly Disagree

**16. What are the reason(s) your staff have not participated in staff development opportunities given by the research center?**



## Appendix G Principal Survey

The partnerships between a major state university, local institutions of higher education, and public and private bodies have resulted in a research center in Southside Virginia. Your school division is within the service area of this research center. Please respond to the items below relative to your staff development needs.

**1. Which level best describes your school? (choose one)**

- Elementary
- Middle
- High

**2. Which school division do you represent?(choose one)**

- Danville
- Franklin
- Halifax
- Henry
- Martinsville
- Mecklenburg
- Patrick
- Pittsylvania
- Governor's School

**3. Teachers in my building need additional staff development in the area of math.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**4. Teachers in my building need additional staff development in the area of science.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**5. Teachers in my building need additional staff development in the area of social studies.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**6. Teachers in my building need additional staff development in the area of reading.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**7. Teachers in my building need additional staff development in the area of English.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**8. Teachers in my building need additional staff development in the area of technology.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**9. Teachers in my building need additional staff development in the area of technology for the following purpose(s) (choose all that apply):**

- Using computer hardware to better deliver instruction
- Using the internet to better deliver instruction
- Using productivity software such as Microsoft Office
- Designing web sites

Other (please specify):

**10. Teachers in my building "most" need additional staff development in the area of technology for the following purpose (choose one):**

- Using computer hardware to better deliver instruction
- Using the internet to better deliver instruction
- Using productivity software such as Microsoft Office
- Designing web sites
- Other (please specify)

**11. Teachers in my building need additional staff development in the area of working with "At-Risk" youth.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**12. Teachers in my building need additional staff development in the area of other (please specify).**

**13. Teachers in my building "most" need additional staff development in the area of (choose one):**

- Math
- Science
- Social Studies
- Reading
- English
- Technology
- Working with "At-Risk" youth
- Other (please specify):

**14. Teachers in my building "most" need additional staff development in content (math, science, social studies, reading, English) areas that is designed (choose one):**

- To enable teachers to gain content knowledge.

- To enable teachers to more effectively deliver instruction.
- To enable students to better perform on Standards of Learning tests.
- To better integrate technology into instruction.
- To meet highly qualified standards.
- Other (please specify):

**15. Teachers in my building have participated in staff development opportunities given by the research center.**

- Yes
  - No
  - No staff development has been offered
- Other (please specify):

**16. The research center has offered staff development for teachers in my building in the area(s) of (choose all that apply):**

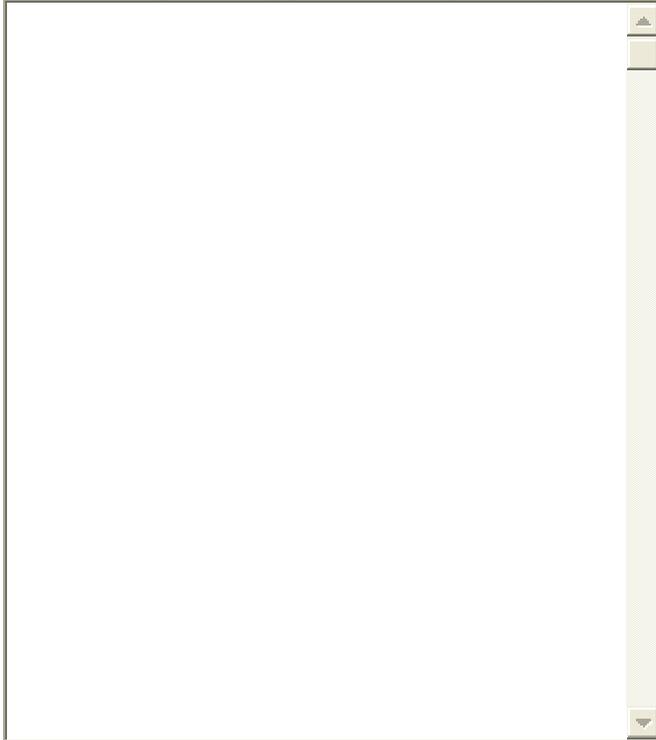
- Math
- Science
- Social Studies
- Reading
- English
- Technology
- Working with “At-Risk” youth
- My teachers have not participated in the research center staff development
- other (please specify) :

**17. If your teachers participated in staff development offered by the research center, was the staff development effective in meeting my staff development needs.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- No staff development has been offered

**18. Has there been anything that prevented teachers in your building from participating in**

**staff development opportunities given by the research center? (Please specify)**



**19. I had an opportunity to provide input into the staff development offerings provided by the research center.**

- Yes
- No
- No staff development has been offered.

**20. I would like the research center to be able to offer staff development in the area(s) of (check all that apply):**

- Math
- Science
- Social Studies
- Reading
- English
- Technology
- Working with “At-Risk” youth

Other (please specify):

**21. I would like to have an opportunity to express our staff development needs for the future to the research center.**

- Yes
- No

**22. I would like to have more information on what the research center could offer my teachers for staff development.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**23. It would be very feasible for my staff to go to the research center if staff development were offered (check all that apply):**

- The staff development was offered during a workday
- The staff development was offered after school but during the school year
- The staff development was offered during the summer
- The staff development was offered during the weekend

**24. Web based staff development opportunities would be a very feasible method of delivery for my staff.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Agree

**25. Teachers in my building would be very interested in information on existing educational programs and resources in the geographic area in these subjects (check all that apply):**

- Math
- Science
- Reading
- Writing

Other (please specify):

**26. Administrators in my building need additional staff development in the area of (check**

**all that apply):**

- School law
- School finance
- Evaluating instruction
- Special Education
- Understanding the implications of NCLB Legislation
- Classroom use of technology
- Administrative use of technology

Other (please specify):

**27. Administrators in my building need improved access to higher education for the purposes of graduate programs (Ed.D., Ed.S., Ph.D.).**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**28. I have visited the research center.**

- Yes
- No

## Appendix H Teacher Survey

The partnerships between a major state university, local institutions of higher education, and public and private bodies have resulted in a research center in Southside Virginia. Your school division is within the service area of this research center. Please respond to the items below relative to your staff development needs.

**1. Which level best describes your school? (choose one)**

- Elementary
- Middle
- High

**2. Which school division do you represent?(choose one)**

- Danville
- Franklin
- Halifax
- Henry
- Martinsville
- Mecklenburg
- Patrick
- Pittsylvania
- Governor's School

**3. I would like to have additional staff development in the area of math.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**4. I would like to have additional staff development in the area of science.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**5. I would like to have additional staff development in the area of social studies.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**6. I would like to have additional staff development in the area of reading.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**7. I would like to have additional staff development in the area of English.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**8. I would like to have additional staff development in the area of technology.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**9. I would like to have additional staff development in the area of technology for the following purpose(s) (choose all that apply):**

- Using computer hardware to better deliver instruction
- Using the internet to better deliver instruction
- Using productivity software such as Microsoft Office
- Designing web sites

Other (please specify):

**10. I would "most" like to have additional staff development in the area of technology for the following purpose (choose one):**

- Using computer hardware to better deliver instruction
- Using the internet to better deliver instruction
- Using productivity software such as Microsoft Office
- Designing web sites
- Other (please specify)

**11. I would like to have additional staff development in the area of working with "At-Risk" youth.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**12. I would like to have additional staff development in the area of other (please specify).**

**13. I would "most" would like to have additional staff development in the area of (choose one):**

- Math
- Science
- Social Studies
- Reading
- English
- Technology
- Working with "At-Risk" youth
- Other (please specify):

**14. I would "most" would like to have additional staff development in content (math, science, social studies, reading, English) areas that is designed (choose one):**

- To enable teachers to gain content knowledge.
- To enable teachers to more effectively deliver instruction.

- To enable students to better perform on Standards of Learning tests.
- To better integrate technology into instruction.
- To meet highly qualified standards.
- Other (please specify):

**15. I have participated in staff development opportunities given by the research center.**

- Yes
- No
- No staff development has been offered

**16. The staff development that has been offered by the research center was effective in meeting my needs.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- No staff development has been offered

**17. Has anything prevented you from participating in staff development opportunities given by the research center? (please specify)**

**18. I had an opportunity to provide input into the staff development offerings provided by the research center.**

- Yes
- No
- No staff development has been offered.

**19. I would like the research center to be able to offer staff development in the area(s) of (check all that apply):**

- Math
- Science
- Social Studies
- Reading
- English
- Technology
- Working with “At-Risk” youth

Other (please specify):

**20. I would like to have an opportunity to provide input into the staff development offerings that could be provided in the future.**

- Yes
- No

**21. I would like information on staff development opportunities given by the research center.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**22. It would be most feasible for me to go to the research center to receive staff development if (check all that apply):**

- The staff development was offered during a workday
- The staff development was offered after school but during the school year
- The staff development was offered during the summer
- The staff development was offered during the weekend

**23. Web based staff development opportunities would be the most feasible for me.**

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Agree

**24. I would like to have information on existing educational programs and resources in the area of (check all that apply):**

- Math
- Science
- Reading
- Writing

Other (please specify):

**25. I would like improved access to higher education for the purposes of graduate programs.**

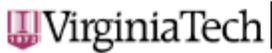
- Strongly Agree

- Agree
- Neutral
- Disagree
- Strongly Disagree

**26. I have visited the research center.**

- Yes
- No

Appendix I Institutional Review Board (IRB) Exempt Approval



Office of Research Compliance  
 1880 Pratt Drive (0497)  
 Blacksburg, Virginia 24061  
 540/231-4338 Fax: 540/231-0939  
 E-mail: [clgrem@vt.edu](mailto:clgrem@vt.edu)  
[www.irb.vt.edu](http://www.irb.vt.edu)

PIA#000005721 expires 7/2007  
 IRB # is IR00000567

DATE: July 26, 2006

MEMORANDUM

TO: Glen Earthman  
 Jeffrey Early

FROM: Carmen Green 

SUBJECT: **IRB Exempt Approval:** "Research Centers as Modes of Technology Transfer Between the University and Industry and the Implications for Public K-12 Schools", IRB # 06-415

I have reviewed your request to the IRB for exemption for the above referenced project. I concur that the research falls within the exempt status. Approval is granted effective as of July 26, 2006.

As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in previously approved human subject research activities to the IRB, including changes to your study forms, procedures and investigators, regardless of how minor. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.
2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

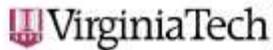
cc: File

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## Appendix J IRB Amendment



Office of Research Compliance  
 1880 Fratt Drive (6497)  
 Blacksburg, Virginia 24061  
 540/231-4558 Fax: 540/231-6959  
 E-mail: cgreen@vt.edu  
 www.irb.vt.edu

FAP00000271 (effective 7/20/07)  
 IRB # is 0000000007

DATE: October 12, 2006

## MEMORANDUM

TO: Glen Earthman  
 Jeffrey Early

FROM: Camen Green 

SUBJECT: **IRB Amendment 1 Approval:** "Research Centers as Modes of Technology Transfer Between the University and Industry and the Implications for Public K-12 Schools", IRB # 06-415

This memo is regarding the above referenced protocol which was previously granted approval by the IRB on July 26, 2006. You subsequently requested permission to amend your IRB application. Approval has been granted for requested protocol amendment, effective as of October 10, 2006.

As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in previously approved human subject research activities to the IRB, including changes to your study forms, procedures and investigators, regardless of how minor. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.
2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

cc: File

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 An equal opportunity, affirmative action institution



**VITAE****Jeffrey B. Early**

2444 Stony Mill Road

Danville, VA 24541

434-489-2959

[jbearly@vt.edu](mailto:jbearly@vt.edu)**Education**

- Tennessee Technological University, B.S., 1987 Secondary Education General Science
- Radford University, Master's of Educational Leadership and Supervision, 1998
- Virginia Polytechnic Institute and State University - Ph.D. Educational Leadership and Policy Studies 2007

**Licensure**

State of Virginia Postgraduate Professional License. Areas of endorsement: Pre-K – 12 Administration and Supervision, Biology, Chemistry, and General Science II

**Experience**

- Director of Special Education; Pittsylvania County Schools, 2004 - present
- Assistant Principal; Pittsylvania County Schools, Tunstall High School, 2000-2004
- Teacher; Governor's School for Global Economics and Technology. 1999-2000
- Teacher; Danville City Schools, Langston Focus Center. 1998 – 1999
- Teacher; Pittsylvania County Public Schools, Dan River High School. 1992 – 1998
- Teacher; Danville City Public Schools, Westmoreland Middle School. 1989 – 1992
- Teacher; Martinsville City Public Schools, Martinsville Junior High and High Schools 1988 – 1989
- Teacher; Henry County Public Schools, Bassett High School. 1987 – 1988