Linking Economic Development and Workforce Diversity through Action Research

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ABSTRACT
The link between economic development and workforce diversity is being explored through an action research project based in an economically transitioning region of central Pennsylvania. This project consists of a collaboration between university researchers, a local college, economic development professionals and the local business community. It is directed at the creation of a sustainable knowledge-intensive, technology-enabled workforce. The intended outcome of this action research effort is ongoing awareness and education programs for the local business community that focuses on helping them to understand: 1) the connection between diversity and economic development in the region; and 2) the barriers to greater workforce diversity that exist in this region.

Categories and Subject Descriptors
H.1 Models and Principles; K.7 The Computing Profession; K.4 Computers and Society

General Terms
Management, Human Factors, Theory

Keywords
Action research, economic development, information economy, IT skills, IT workforce, human capital, diversity, minorities, race, gender, ethnicity, under represented groups, social inclusion

1. INTRODUCTION
The twenty-first century is witnessing, on a global scale, the transition from labor-intensive agrarian and industrial economies to knowledge-intensive, technology-enabled service economies. Thus, the predictions of Daniel Bell about the emergence of a post-industrial society are coming to fruition [6]. Even though this transition is occurring unevenly around the world, it appears that economic development is increasingly tied to the viability of technology-enabled, knowledge intensive "high tech" work [36]. Just as the availability of good land and water is crucial to the viability of an agricultural economy, and access to appropriate natural resources is crucial to an extraction-based industrial economy, access to human capital is crucial to the long-term viability of a knowledge economy. To the extent that a region or nation has a supply of this human capital, it will be attractive to knowledge economy employers, thereby strengthening its economic development status.

The challenge for regions that already have a supply of human capital is to retain this economic asset; the challenge for regions experiencing economic underdevelopment is to find ways to retain a greater share of their human capital and to attract more. Addressing this economic development hurdle requires the efforts of economic development professionals, policy makers, local industry and the educational community. Thus, the existence of a human talent pool can be seen as a significant infrastructural requirement for a knowledge-intensive economic sector, and the development and sustainability of this human infrastructure can be seen as directly tied to the success of economic development efforts. One aspect of this challenge that needs attention is the role of workforce diversity in the overall effort to develop a sustainable human infrastructure. Thus, an important research question is centered on the linkage between knowledge-economy development, and the development, recruitment and retention of a diverse labor pool.

An appropriate location for the examination of these issues is Pennsylvania. Beginning in the last quarter of the twentieth century, and accompanying the decline of the steel industry and the subsequent spillover to other sectors, Pennsylvania is among the states feeling the greatest negative effects of the out-migration

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of the young, educated workforce [2]. This is particularly the case in central Pennsylvania.

In 2006, the Altoona Blair County Development Corporation, a leading regional economic development corporation in the area released its revised strategic plan entitled "Blair County 2030." Reflecting upon many of the serious structural challenges impacting the central Pennsylvania region, the corporation's plan addressed the critical linkage between an available, growing and diverse talent force with the ability to succeed in knowledge-based wealth generating economic development.

Their report notes that while Pennsylvania's population is growing at a very slow rate (2 percent between 1994 and 2004 as compared to a national rate of 11.6 percent during that same period), the central region and the focus of this action research project, in particular, is actually losing its overall residency base. This county lost -1.1 percent of its total population between 1990 and 1999. The Center for Rural Pennsylvania reports that this county lost an additional -2.1 percent between 2000 and 2006. To compound the problem, the region is also aging rapidly. Twenty-five percent of the population is now over the age of 60. Finally, the central region is out-migrating its younger educated population between the ages of 24 and 35 without a statistically relevant rate of in-migration. Given the county's current age distribution with significantly more residents turning 65 than those under 25 expected to remain, this trend will likely amplify in the next 10 years.

Thus, a key component of economic development in Pennsylvania is the development of a sustainable technology-enabled human infrastructure made possible through the retention of the young educated workforce. As the population demographics of Pennsylvania show, turning the tide of the 'brain drain' is of paramount importance for this state. A crucial part of the goal of sustainable human capital is that all human capital be included in this vision.

This paper describes an ongoing action research project, being carried out in several phases, that was undertaken in order to establish a link between the development of a knowledge-intensive, technology-enabled sector and human capital diversity in an economically depressed region of Pennsylvania. The sections below provide the details of the collaboration among university researchers, a local college, economic development professionals and the local business community. The intended outcome of this effort is ongoing awareness and education programs that focus on helping local business people to understand: 1) the connection between diversity and economic development in the region; and 2) the barriers to greater workforce diversity that exist in this region.

2. LITERATURE REVIEW

As we argue in the introduction section, to develop and sustain a knowledge-based economy, it is important to foster an inclusive environment so as to attract and retain a diverse and appropriately educated workforce: the human capital. In this section, we examine, in greater detail, the relevant literature that explores the relationships between a knowledge-based economy and human capital, between human capital and diversity, and between diversity and economic development.

A knowledge-based economy is an economy in which knowledge is the key economic resource, and the generation, diffusion, and exploitation of knowledge plays a predominant part in wealth creation and economic growth [10][11][21]. In a knowledge-based economy, the long-term economic growth depends on the synergy between continuous knowledge creation, application, and the effective utilization of knowledge, skill and innovation potential, which is embedded in human capital [5]. In other words, human capital -- a highly educated and skilled knowledge workforce -- is one of the driving forces for economic development.

One stream of human capital theories is concerned with human capital development. It suggests that investment in education and training is the key factor in producing human capital by imparting knowledge and skills, and as a result, enables economic and social development [5][26]. Both developed economies and transition economies have recognized the criticality of ensuring a continuous supply of a qualified knowledge workforce in order to build innovation capacity and sustain economic growth [22][31][34]. For example, in Ireland, a free secondary educational system since the 1960s and the introduction of a nearly-free university educational system since 1996 have contributed a great extent to Irish economic leapfrogging [9][30][31][32]. In Singapore, in addition to innovating formal educational systems, the government has actively developed and implemented training and e-learning programs to facilitate IT skills upgrading and promote life-long learning [38]. The availability of a large, talented human resource pool with solid engineering training is credited as a crucial enabler for India to become the world's largest software and IT services exporters [1][8][20]. However, India is now facing the challenge of improving the quality of IT education and increasing the capacity of its highly educated IT workforce in order to satisfy the growing demands at the same time [1][12][22].

Another stream of human capital theory is concerned with the geographical distribution of human capital. It focuses on studying the reasons for uneven human capital distribution and the factors contributing to the attraction and retention of human capital in a given region. Prior research on regional economic development has provided evidence for the existence of an important link between human capital and regional economic development [19][23][24][27]. Researchers have also discerned a trend called "human capital clustering" in which the human capital continues to become ever more concentrated [7][14][15][16][18][23][28].

In this vein, the research by Florida [14][15][16] shows that concentrated talent (or the creative class) clusters are most likely found in metropolitan areas in which the following are in evidence: low entry barriers for human capital; high levels of urban services; and tolerance of ethnic, cultural and social diversity. In one recent study, Florida and his colleagues examine the effects of three regional institutional and cultural factors on the geographic distribution of human capital (or creative class), including the presence of major research universities, the distribution of amenities and services, and the tolerance and openness to diversity [17][18]. Their findings indicate that these three factors are not exclusive of one another, but rather tend to play complementary roles in attracting different types of talents. Moreover, they found that while all three factors affect the geographic distribution of human capital and the creative class, the tolerance and openness to diversity is more significantly associated with human capital and the creative class than the

presence of major universities and service diversity. Trauth et al. [36] also identity two cultural barriers – attitudes to continuous learning and a climate that fosters a diverse labor force – in their research on the sustainability of an appropriately educated knowledge-economy workforce in Pennsylvania.

One line of investigation has sought to understand ways in which diversity may affect the economic development of a region. In an investigation of the value of IT workforce diversity, Trauth et al. [33] argue that IT workforce diversity itself is a valuable asset for both primary and secondary information sectors, and such value is manifested in different ways. On the one hand, IT workforce diversity will facilitate innovative problem solving through the inclusion of diverse experience, skills and knowledge perspectives. On the other hand, the diverse socioeconomic backgrounds of the diverse IT workforce (derived from their demographic characteristics and life experiences) will also enable the development of diverse IT products and services to serve the different needs of different groups of people. Furthermore, the interactions among a diverse group of people will stimulate creativity and thus lead to technology innovation [33].

The study by Trauth et al. [36] on economic development in Pennsylvania has also documented the link to workforce diversity. In this study participants discussed the meaning of diversity and its relationship to the IT field. Respondents spoke about demographic diversity such as gender, age, race and religion and the benefit to the IT field. The benefit of sensitivity to fostering labor force diversity lies in the different skills and attributes that such diversity brings to a work team. The benefit of sensitivity to recognizing consumer diversity is providing better service to the customer. Thus, there is evidence that IT professionals need to recognize that they support all types of people in all types of jobs. Therefore, having a diverse IT staff is important in order for it to be able to understand and work with those they support.

With regard to the value of a diverse culture, Florida et al. [18] point out that a diverse environment (characterized by tolerance and openness to diversity) may affect regional economic development by increasing the efficiency of some key regional resources. For example, openness to diversity can lower the barriers to entry for highly skilled and educated people across gender, sexual orientation, race, ethnic or age lines [18][33][34]. Tolerance and openness to diversity can also foster a regional culture that tolerates risks, embraces innovation and changes, facilitates networking and collaboration among different organizations and sectors, and as a result, assists in effective utilization of regional talents and resources and accelerates knowledge spillovers [18].

3. RESEARCH METHODOLOGY

The primary goal of the research reported here is to investigate barriers to greater workforce diversity existing in a particular region of central Pennsylvania, to promote awareness of the connection between diversity and workforce recruitment and retention in the local business community, and to help local businesses assess their diversity climates, develop subsequent interventions and implement changes. Our research is concerned with investigating and solving a practical problem, and creating changes in the local community. Hence, we employ an action research approach.

3.1 Relationships between Theory and Research

We utilize the intersection of theories of diversity, human capital and regional economic development as a sensitizing device to investigate a contemporary problem confronting a particular community, and as a guide to develop appropriate solutions to fit the specific dynamics of the local context [4][29]. The practical knowledge generated in this action research accordingly informs the theory and expands the relevant theoretical knowledge [3][4].

3.2 The Role of Researcher

This action research involves participation and collaboration of a leading national academic institution in the region, economic development agencies, local business organizations and non-profit agencies. In this research, we as researchers, have multiple roles [3][25][29]. First, we function as a knowledge source to bring our theoretical knowledge and expertise into the research process. Specifically, the research design, data collection guides and data analysis techniques were based on the researchers' prior experiences and knowledge. Second, we act as analysts to assist stakeholders in identifying their problems. For example, during the focus group and interview sessions, the participants were asked questions that caused them to analyze community problems (e.g. racial tensions, lack of educational values, etc.). Third, we also act as facilitators to support stakeholders devising effective solutions. It was not uncommon for the researchers to provide information to participants about their needs particularly if they related to local resources that could be of assistance in their specific situation. And forth, we are members of a research community, who seek to produce theoretical and practical knowledge that is relevant to both academics and practitioners.

3.3 The Research Process

According to Baskerville [3], the essence of action research is a two-stage iterative process, including the diagnostic stage and therapeutic stage. In line with these two stages, this research project has been carried out in three interconnected phases. They are interconnected in that the output of the previous phase fed or became the input to the subsequent phase. For instance, data from phase one was used to "investigate" or to develop the data collection tools in phase two through the creation of a focus group guide. The data collected in phase two was then used to "intervene" or identify and implement research actions that occurred in phase three. Although, not yet conducted, future research intends to recruit new stakeholders in the Human Infrastructure Committee who were identified in phase three of the research cycle. Figure 1 illustrates the three-phase research process. In the following section, we detail the research process by describing the motivations, goals, timeline and activities of each phase.

3.3.1 Phase I: Forming the Human Infrastructure Committee

The first effort to link economic development to workforce diversity was undertaken in winter of 2005. The regional economic development corporation joined forces with a local college in forming the Human Infrastructure (HI) Committee. The HI committee members included education, civic, religious and

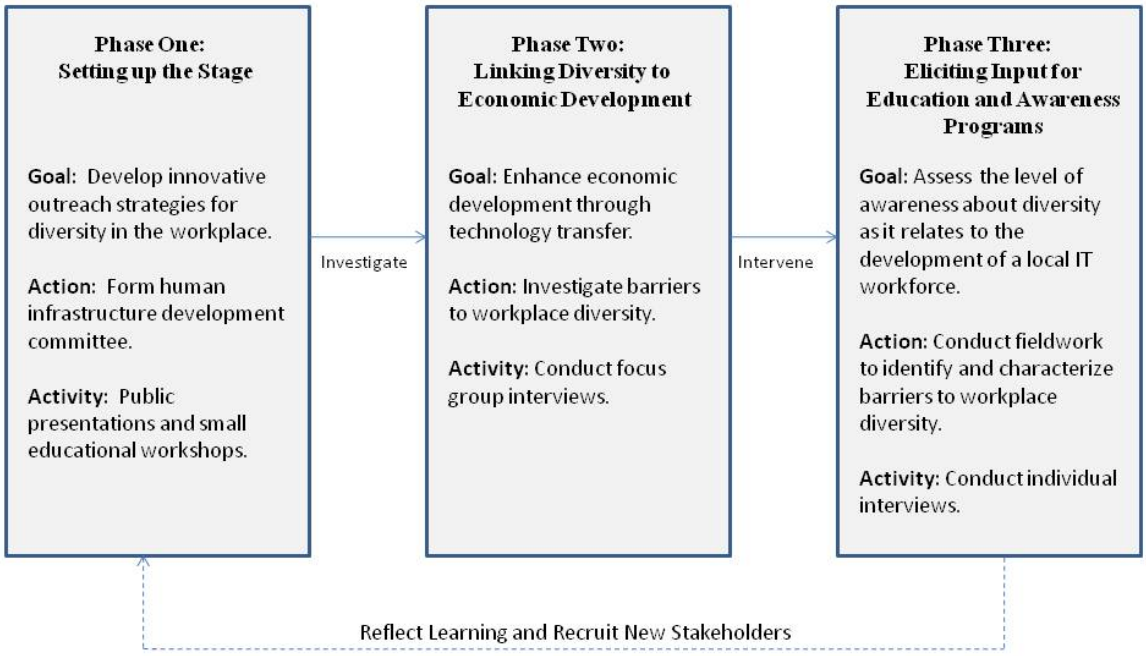

Figure 1. The Three-Phase Research Process

industry representatives. Their mission was to develop innovative outreach strategies based on a global economic "pro-business case" for diversity in the workplace.

Their activities consisted of public presentations and small educational workshops. Their efforts were both proactive as part of a forward thinking economic development strategy, but also reactive, taking place during a high-profile local murder committed by an illegal immigrant. Members were confronted with an entrenched constituency fueled by intense local media coverage of the case. The fourth author was one of the stakeholders in these presentations and workshops.

3.3.2 Phase II: Linking Diversity to Economic Development

The second effort was undertaken in the spring and summer of 2006 as part of a research seed grant[1] that was awarded to the first author. The objective was to investigate barriers to greater participation by under represented groups in the effort to enhance economic development through the stimulation of technology transfer to local companies in this region. Three focus groups were conducted with participants representing local businesses, economic development professionals and workforce development professionals. The discussions in these focus groups centered around barriers to the development and sustainability of a more diverse labor force in the area. The focus groups were conducted by the first author. The fourth author, who represents the economic development constituency, facilitated these focus groups by identifying and recruiting participants. Items discussed in the focus groups are shown in the Appendix.

3.3.3 Phase III: Developing Education and Awareness Programs

The third effort was undertaken in the winter and spring of 2007 as part of an economic development outreach grant that was awarded to the first author.[1] The objective of this project was to conduct fieldwork in the local business community in order to asses the level of awareness and understanding about diversity as it relates to the recruitment and retention of a labor force to support knowledge-intensive and IT-enabled work in the region. The purpose of conducting this research was to enable the team of investigators and stakeholders to identify and characterize the barriers to greater diversity in the knowledge-intensive and IT-enabled employment sectors in the region so as to develop subsequent awareness and education interventions. Six face-to-face structured individual interviews were held with professionals who are employed in knowledge-intensive careers in the area. Four additional face-to-face structured interviews were held with economic and workforce development professionals also employed in the area. The discussion in these interviews was twofold: to understand the participants' views and experiences about barriers to diversity in knowledge-intensive careers; and to identify effective and relevant educational interventions that could

[1] Penn State Economic and Workforce Development Thematic Initiative Fund Grant.

be developed to foster diverse human capital in the region. This fieldwork was conducted by the second author. The fourth author facilitated recruitment of participants for these interviews. Items discussed in the interviews are shown in the Appendix.

4. FINDINGS

Several themes emerged from these phases that resonate with prior research and human capital theories. Specifically, four themes emerged: 1) the continual recognition of the existence and the value of diversity to a knowledge economy; 2) the barriers to achieving greater regional diversity in support of a knowledge economy; 3) stakeholder responsibilities for recruitment and retention of diverse talent; and 4) the role of educational interventions for diversity building in a knowledge economy. The remainder of this section discusses each of these themes in more detail.

4.1 Recognition of Existence and Value of Diversity to a Knowledge Economy

The region in which this project was conducted is approximately 98 percent white. In addition, the number of foreign born persons is less than one percent [13]. Hence, there is a significant challenge to overcome negative stereotypes that are allowed to fester in an atmosphere in which there is little direct experience to serve as a basis for challenging them. As a result, much of the initial motivation for the creation of a Human Infrastructure (HI) Committee was to help stem the tide of talent leaving the region. Currently, the HI Committee is comprised of 30 to 40 people and has primarily focused on the areas of succession planning and talent attraction and retention.

This theme also drew from literature that articulated the need to both recognize and value diversity in the knowledge economy [33]. Hence, participants in both the focus groups and the interviews were asked to discuss their understanding of diversity and the connection to the IT field. All of the participants understood the concept of diversity, but many felt that diversity was a loaded term. Consequently the participants indicated that the term is frequently misunderstood by people in the region. For instance, one interviewee explained that co-workers typically use the term diversity to describe non-White individuals. In addition, most of the participants felt diversity was important to IT-enabled careers, but could not articulate exactly why they felt it was important. They recognized that diverse human capital is important aspect of knowledge-enabled career, but felt uncertain about how to deal with the associated challenges and issues. For example, in one of the focus groups, a sense of foreboding dominated the discussion of diversity. The participants acknowledged the inevitability of people from 'the outside' coming into the region with worried resignation. In another focus group the discussion of diversity quickly escalated into a discussion of all of the social ills – such as drugs – resulting from the influx of 'outsiders.'

4.2 Barriers to Achieving Greater Regional Diversity in Support of a Knowledge Economy

The participants in the focus groups and interviews discussed the close knit relationships among residents and families of central Pennsylvania. They agreed that this closeness creates an environment that is often difficult for newcomers and outsiders to break into. The participants also felt that instances of racism are not intentional, but rather result from a lack of understanding of human differences. Some participants also felt that the existence of hundreds of municipalities in the state impedes regional progress.

All of the interviewees acknowledged that the region has very little racial and ethnic diversity. For instance, an African-American interviewee explained how he feels living and working in the area:

"I feel like a raisin in a bowl of milk." I have gotten use to being the only Black person at work, in the neighborhood and around the community. It is tough though."

For these reasons he believed it would be difficult for a non-White individual to acclimate to the region given the lack of racial and ethnic diversity and the close knit relationships among residents and families of central Pennsylvania. The participants also discussed the difficulty in attracting diverse talent to the area to fill open positions. Some felt the rural geography and lack of diversity in the area was perceived as a negative to prospective employees. Several focus group participants, however, felt this area is attractive to workers they referred to as 'boomerangs' or those originally from the area who are looking to return to their hometown to raise a family. While this trend would add to the knowledge base of the region, it would not add to the diversity in many categories such as race and nationality. Some participants were hopeful that if intellectual diversity were strengthened by the return of well educated workers that social diversity would follow.

4.3 Stakeholder Responsibility for Recruitment and Retention of Diverse Talent

If the community, organizations and individuals all stand to gain from regional diversity, who should be responsible for attracting and retaining diverse talent? The Human Infrastructure Committee recognized the need for stakeholder participation from a variety of groups. The committee was originally created with professionals and CEOs at local organizations. Over time the committee expanded its membership to include affiliation with a local chapter of a professional human resource organization.

The consensus from the focus groups and interviews was that a multi-faceted approach is necessary to recruit and retain diverse talent. Several of the interviewees agreed that recruiting diverse talent is an important goal, but felt unprepared to address the problem alone. For instance, one interviewee owns his own multi-media communications firm and he discussed the difficulties he faces when recruiting diverse human capital:

"It is extremely challenging to find skilled professionals in the area to fill my job demands. Finding someone with both the skills and diversity would be nearly impossible. The labor pool here is too limited for that type of requirement."

He and the other interviewees felt that organizations and industry leaders should take the lead in attracting diverse talent to the area through outreach initiatives. But these initiatives will also need the support of local political leaders, church

groups, and the school systems to be successful in the long-term. For instance, one interviewee explained:

"I would like to see the area become more diverse. But I am just one person. I can't do it alone. I think we need to address the problem from multiple perspectives. Like our universities, our local government and community groups."

This theme is supported in prior research that identifies the importance of a multi-faceted approach to diverse human capital creation from national and regional governments [9][30][31][32][38], regional institutions [19][23][24][27] and community members [17][18][36].

4.4 Barriers to Achieving Greater Regional Diversity in Support of a Knowledge Economy

The completion rate for high school in this region varies from 78 to 83 percent, depending upon the particular county in the central Pennsylvania region. Likewise, the attainment of post-secondary degrees (i.e. bachelors degree or higher) ranges from 10 to 13 percent [37]. Yet, as previously discussed, life-long learning is an important component of building diverse human capital [5][26][38]. In the focus groups and the interviews the participants discussed the lack of value placed upon formal education in the region. Many felt that Pennsylvania does not have a culture of education. This is due, in part, to the age of the population. They also attributed it to the fact that the majority of work has historically been in extraction (e.g. coal mining, lumber), manufacturing (e.g. steel manufacturing), and farming.

Some participants, however, felt this value was changing and felt many of the public school systems were improving. Consequently, the region is undergoing a paradigm shift in recognition of the educational components necessary in a knowledge economy. Another interviewee served on the regional school board and agreed that this shift in values is occurring, but is taking time to permeate regional culture:

"I have been serving on the school board for several years now and I can attest that the community recognizes the value of education now more than ever. We still have work to do, but at least parents and teachers are beginning the dialogue."

One connection between formal education and diversity is that participation in post-secondary education provides an individual with an opportunity to interact with a wider range of people and to become exposed to new ways of thinking. Thus, it is possible – though not guaranteed – that post-secondary education could serve as a vehicle for greater awareness and understanding about diversity.

Another vehicle for awareness and education is targeted diversity training. This topic was specifically raised in the interviews. The majority of the respondents questioned the need for diversity training citing former negative experiences with such activities. Many of the interviewees felt that diversity education is important, but they were not convinced that traditional approaches would suffice. They felt innovative thinking is necessary in terms of the pedagogical approach, delivery method and content. For instance, one participant felt that a traditional classroom environment with an instructor and students would not be successful. He felt a better approach would be to utilize problem-based learning and case study approaches to help students recognize themselves in the learning experience. Other interviewees felt an on-line delivery mechanism would be beneficial for information diffusion and distribution. For example, one participant explained:

"Everyone is so busy with work and life. I seriously doubt people would want to add another thing to their to-do list. What would be better is if I could take the training on-line during my own schedule."

Prior pedagogical research has also stressed the use of inclusive teaching, teaching in discipline context, and using a variety of identity models when teaching diversity [34][35].

5. CONCLUSION

In this paper we present the results of a multi-phased action research project directed at investigating the creation of a sustainable knowledge-intensive, technology-enabled workforce. Important findings resulted from this exploration, which hold implications for both practice and research.

5.1 Implications for Practice

Perhaps one of the greatest implications for practice is the action research based aspect of the project. Findings from the data collection efforts were used to inform HI Committee and the economic development agency's approaches for building diverse human capital in the area. That is, the findings were seen not just as more fodder for academic journals, but rather as valuable insights to be used by practitioners to inform how they approach real world problems. Specifically, findings were used to help shape the committee's long-term vision and membership recruitment plan. In addition, the HI Committee used findings from this research to develop informational presentations that addressed the need for clarification about how to attract and retain diverse talent. Finally, several information sessions were also held at a local university to inform students about career opportunities in the area after graduation.

Another implication for practice that stems from this research is the ability to develop future educational interventions. The research discussed above has been conducted in part with a long-term goal of developing educational interventions for the region. These interventions could be aimed at a variety of topics such as: building an understanding of diversity and the relationship with knowledge-intensive careers; explaining the role of various stakeholders in recruiting and retaining diverse talent; and considering ways to address barriers that impede the development of a diverse human capital base. As a part of this on-going initiative, a local university has also expressed interest in offering an on-line diversity training course for all incoming students as a part of the orientation program. Furthermore, the first author has been in contact with local university and corporate training professionals about potential efforts.

5.2 Implications for Theory

Our findings corroborate arguments put forth by authors such as Florida and Trauth et al. about the importance of building a common ground concerning what diversity really means to the local community. They also add to the discourse that is helping to articulate the value of diversity, and, in particular, how

diversity may create value for local culture, human capital and economic growth [33]. When comparing the socio-cultural context of this local community with Florida's theory about human capital distribution [17][18], we can clearly see that two of the three regional institutional and cultural factors contributing to attracting and retaining human capital do not exist: service diversity and cultural diversity. Therefore the task of building diverse human capital in this community is a significant challenge.

Another implication for theory is the confirmation that building diverse human capital is a complex and multi-faceted task. As these findings show, regions who are interested in doing so, should be prepared to address diversity problems from multiple perspectives at the same time. This supports prior research that stresses the need for a variety of solutions (i.e. government programs, educational programs, community programs, etc.). In response to this issue, the Altoona Blair County Development Corporation has developed a partnership with the HI Committee in hopes of increasing community involvement in building diverse human capital.

A final implication for theory is the evidence that these findings contribute to our understanding of the many ways in which the knowledge economy is different from the manufacturing and agrarian economies. Along with the differences in the type of work accomplished is the difference in the type of workforce that is needed. Today's workplace requires not only workers with appropriate skills and experiences, but it also requires a workplace that promotes tolerance and educational values.

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APPENDIX: FOCUS GROUP AND INTERVIEW TOPICS

2006 Focus Group Topics

- Is having a diverse workforce an important goal?
- In this region do barriers currently exist to the recruitment of a workforce with certain demographic characteristics (e.g. race, gender, nationality, etc.)?
- In this region do barriers currently exist to the retention of a workforce with certain demographic characteristics (e.g. race, gender, nationality, etc.)?

2007 Interview Topics

- Respondent background information
- Defining diversity
- Importance of diversity
- Relationship between diversity and knowledge-intensive and IT-enabled careers
- Barriers to increased recruitment and retention of diverse talent for regions' knowledge-intensive companies
- Responsibility for diversity in region
- Local cultural factors that may affect human infrastructure in knowledge-intensive and IT-enabled careers
- Linkage between cultural barriers (i.e. exclusion, hostile work environment, discrimination, sexual harassment, etc.) and human infrastructure attraction or retention.
- Participated in diversity or human infrastructure education.
- Benefits to region from human infrastructure education (delivery mode, content)?
- Suggestions for policy makers, educators or industry with regard to the human infrastructure in knowledge-intensive and IT-enabled careers.