

TRANSFORMATIVE LEARNING IN A POST-TOTALITARIAN CONTEXT:
PROFESSIONAL DEVELOPMENT AMONG SCHOOL TEACHERS IN RURAL
SIBERIA

by

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B.A., University of Kansas, 1991
M.S., Minnesota State University, 1994

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Adult and Continuing Education
College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

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Abstract

This study focused on the professional development experiences of teachers in the Altai Republic, Russian Federation. Russia is a country in flux, transitioning from a totalitarian state into a democracy reflective of its unique ethnic composition, geographic context, and history. The Russian educational system is currently undergoing computerization and teachers are learning to integrate educational technology into classroom practice. In this setting, teachers are beginning to learn how to integrate educational technologies into their classroom practices. This qualitative study explored the potential for transformative learning associated with this type of learning and experience.

Transformative learning theory (TLT) was used to explore if and how the worldviews and perspectives of teachers is changing with respect to their educational philosophies and classroom practice. The study utilized multiple sources of evidence (interviews with program and school administrators, school teachers, observation) and multiple units of analysis (federal/republic levels of training and support, school level training and support, informal experiences, teachers, administrators).

Findings indicated that the methods used to train teachers have a high likelihood of being facilitative of transformative learning. It also found that teachers are beginning to think and act in new ways based on their experiences with educational technology. Teachers are also collaborating in this learning process, which provides an important support for continued learning and growth. Findings also indicate that TLT is a useful framework for exploring transformative learning in this setting and helped to uncover the elements of transformative learning which are culturally determined. Further research is needed to further our understanding of how transformation occurs and is experienced in this setting. Collaboration with local experts and researchers is necessary to uncover the cultural differences related to perspective change.

Many future pathways are available for continuing to explore transformative learning in this context. They include continued work with teachers, a general exploration of transformative learning, and work with university students.

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CHAPTER 1 - INTRODUCTION

Background

Transformative learning theory (TLT) is the process by which the worldviews of individuals, groups, and organizations are changed as a result of educational activities. TLT is focused on “how we learn to negotiate and act on our own purposes, values, feelings and meanings, rather than those we have uncritically assimilated from others—to gain greater control of our lives as socially responsible, clear-thinking, decision makers” (Mezirow & Associates, 2000, p. 8). The outcome of transformative learning is perspective transformation. To date, research on transformative learning theory (TLT) has largely focused on the components of the process and on how to foster perspective change in adult education settings (E.W. Taylor, 2000). While TLT has been researched in a variety of educational settings, such as professional development (Dumochel, 2004; Smith, 1999; Saavedra, 1995), higher education (K. Taylor, 2000; Cohen and Piper, 2000; Gliszinski, 2005; Barlas, 2000), and community education (Waithe, 2005; Silverman, 2004), these applications have all been situated in fundamentally democratic contexts. Is transformative learning theory applicable and relevant in a post-totalitarian context?

The Russian Federation is a country in transition. It is currently in the process of becoming something different than it ever has been in the history of Russia or the Soviet Union. Russian citizens historically have had very limited (perhaps non-existent) experience with participatory democracy. For seventy years the Soviet government perpetuated a system of fear and oppression, which has yet to fully dissipate. The result is a nation of people who have been trained to not have opinions on important and relevant issues (Popov, 1995). Popov describes several beliefs detectible in the contemporary mass consciousness of the Russian citizenry. They include

- 1) a silent acknowledgement of the ruling elite’s absolute power and of the inevitability or even necessity of the ‘ruler’s’ total control over all aspects of life; and
- 2) a feeling in an individual of dependency on the state and confidence that the state will solve all economic and social problems. (Popov, 1995, p. 9)

In order to transform a society from a totalitarian system in which citizen participation and decision making is not valued or even permissible into one in which an informed, active citizenry is viewed as an essential asset, perspective transformation or changes in the mindset or mass consciousness Popov describes above become imperative.

The education of adults is a crucial factor in the creation and maintenance of a democratic society (Jug & Pöggeler, 1996). Effective adult education that supports citizen participation in democracy should include transformative educational experiences and training that builds individual and community capacity for personal accountability, decision making, leadership, and evaluation (Lindeman, 1926). In order to facilitate a transformation into a sustainable participatory democracy, change in Russia must occur at the institutional level.

One institution whose transformation could support the development of a democratic civil society is the educational system.

The society and community in which we live have powerful norms about education and the role of the educator....Today, education may be viewed as a way of promoting good citizenship, socializing people to fit into a profession or organization, providing the building blocks of democracy, improving productivity, cultivating future leaders, and freeing people from oppression. (Cranton & King, 2003, p. 34)

The Soviet educational system inherited by Russia was a reflection of its historically centralized political and social systems. In the classroom, power and authority laid with the teacher. By shifting from a teacher-centered model to a learner-centered model, something very significant could occur in the realm of classroom practice and philosophy (King, 2002). Such a shift could create the conditions necessary for a democratic learning model to develop (Brookfield & Preskill, 2005; Knowles, 1980). According to Knowles, democratic practices are characterized by

a spirit of mutual trust, an openness of communications, a general attitude of helpfulness and cooperation, and a willingness to accept responsibility, in contrast to paternalism, regimentation, restriction of information, suspicion, and enforced dependency on authority. (1980, p. 67)

In such an educational environment, learning evolves from a banking system of education, in which teachers have all the knowledge and deposit it into students (Freire, 1970) into a system in which power in the classroom is shared and students have more responsibility for their learning. Students educated in this model will have the potential to grow into adults whose views of the world and their roles in it may be quite different from that of previous generations (Ayers, Hunt, & Quinn, 1998). These future citizens will have different expectations about government and their relationship with it.

Not only will the transformation of the educational system impact future generations of Russian citizens, but these types of transformations have the potential for immediate impact, especially in rural areas. The role of teachers in rural areas extends beyond the classroom. Teachers and schools in rural areas in Russia serve more than just children, they “have an important role to play in binding together the local community” (White, 2000, p. 691). The role of teachers in such contexts provides a pathway for social change to occur at the community level, as well as in the classroom.

One pathway to transforming an institution like an educational system is through the use of educational technology. The integration of educational technology into learning activities has been an emergent phenomenon in both developed and developing nations for the past several years. The use of educational technology in adult education activities has potentially transformative ramifications at the societal and institutional levels (King, 2002). The nature of effective learning about educational technology and its integration into school curricula and classroom practice requires that learners of all ages develop the critical thinking skills necessary to intelligently negotiate the vast amounts of information currently accessible through technology. In order to maintain a sufficient level of technologic savvy, it is essential for learners to become increasingly self-directed as their knowledge about educational technology and its uses develops. Emphasizing critical thinking skills and self-directed learning in professional development activities has the potential to transform learners’ perceptions and worldviews in general (Mezirow & Associates, 2000; Brookfield, 1987; Cranton, 1994) and in particular about educational philosophy and practice (King, 2002). When teachers participate in educational activities that are learner-centered, rather than teacher-centered, they often modify their own classroom practice and philosophies to follow suit (King, 2002). This type of change

could potentially lead to transformations in an educational system and in other societal and political institutions as well, if the learning activities are facilitated in a manner that encourages perspective transformation. Exploring the potential impacts of professional development centered on educational technology on teachers and their classroom practices could yield valuable information on how societal transformations can be facilitated and sustained.

Statement of the Problem

Past research on transformative learning has largely been situated in fundamentally democratic contexts. Very little research exists that explores whether transformative learning theory, which has evolved from within democratic contexts, has any applicability to social and political transformations occurring in a post-totalitarian context. This project explored the potentially transformative experiences of school teachers engaged in professional development activities geared toward improving the educational experiences of their students. What happens when teachers in rural areas in Russia learn how to integrate educational technology into their classrooms and curricula? Do the teachers experience any shifts in perspectives or previously held assumptions about their role as teachers? If so, how are these changes evident in their practice? What is the role, if any, of teacher-to-teacher knowledge transfer in these changes in perspective transformation and classroom practice?

The impact on Russian teachers of professional development centered on educational technology can be investigated by examining it within a specific context. The Altai Republic is located in southwestern Siberia. It is an autonomous republic of the Russian Federation, located just north of the nexus of China, Mongolia, and Kazakhstan. It is home to a population of approximately 200,000 ethnic Russians, indigenous Altaians, Kazakhs, and other ethnic identities. Currently, the Russian Federation is in the process of transforming itself from a repressive, totalitarian regime into a democratic society, although recent political events seem to have eroded Russia's progress toward democracy. (This will be described in more detail in Chapter 2.)

Two Ministry of Education programs are working to address the issue of computerization in the schools. The Institute for Teacher Training (ITT) provides

continuing education to practicing teachers on a variety of topics. In 2004, they began providing courses in computers to teachers (Transcript 9, personal communication, September 12, 2006). A second initiative, the Center for the Evaluation of Education (CEE), provides computers, Internet connections, and resources to schools in the Altai Republic. CEE is an organization which emerged from the efforts of the republic government and the local university to address resource problems of rural schools in the Altai Republic. As part of their joint mission, CEE and ITT provide professional development for teachers in how to use educational technology in the classroom and in curriculum development. Originally, one informatics teacher from each school received training directly from CEE/ITT and then was responsible for sharing this knowledge with other teachers in their school (Transcript 26, personal communication, August 19, 2005). The CEE/ITT utilizes a training program provided by the Intel Corporation as the basis for its introductory courses in using educational technologies. Intel Teaching for the Future is a worldwide initiative which was launched in Russia in 2002. Teachers not only learn to use the technology, but “participating teachers also learn to collaborate, improve their knowledge, and trust new technology” (Intel Corporation, n.d). During the time in which data was being collected, the teacher to teacher training component dwindled and CEE/ITT became responsible for providing training to all types of teachers.

Purpose of the Study

The purpose of this project was to document the methods and approaches used by the CEE/ITT program to teach school teachers about the use of educational technology and to examine the extent to which these methods and approaches have lead to perspective transformation. This investigation allowed me to analyze the role of CEE/ITT programs in the facilitation of any perspective transformations found in its program participants. I examined changes in teachers’ perspectives towards teaching and in their actual classroom practice. This enabled me to document any perspective transformation and the extent of any resulting changes in classroom practice and educational philosophy among teachers and within their schools.

Overview of the Study

This project investigated perspective transformations in educational philosophies that school teachers in the Altai Republic hold during the process of learning how to integrate educational technology into the classroom. I examined whether or not the methods used to instruct adult learners in the use of educational technology were facilitating transformative learning experiences among school teachers in this setting; and, if so, the extent to which this was occurring. I explored how these perspective transformations are reflected in the school teachers' current educational practices. Furthermore, I examined the role of teacher-to-teacher knowledge transfer in teachers' perspective transformation.

Research Questions

This project addressed three research questions:

- 1) Are the methods used by the CEE/ITT program to train school teachers in the use of educational technology facilitative of transformational learning?
- 2) What, if any, perspective transformations occur in school teachers when they engage in professional development focused on educational technology and how are these changes manifested in classroom practice and educational philosophy?
- 3) What is the role of teacher-to-teacher knowledge transfer in facilitating any perspective transformations among teachers?

Given that there is no published research on adult education in the Altai Republic, the use of qualitative research methods was an appropriate strategy for beginning to document both the research setting and the activities upon which I focused. The phenomenon I wished to observe must be understood in light of the local context of rural schools in the Altai Republic and the reasons they have for integrating the use of educational technology into the curriculum and classroom practice. As this information is contextually bound it was best observed through qualitative methods (Yin, 1994). The information necessary to complete the research objective was only available through building relationships with local contacts and interviewing and observing participants on site. Also, the methodology used for this study required that the researcher be immersed in the local context to the fullest extent possible (Esterberg, 2002).

Due to several factors, this project was conducted in two phases. These factors included 1) the highly personal, emotional, and risky nature of perspective transformation (Mezirow & Associates, 2000); 2) the need to establish rapport with the research participants, (Esterberg, 2002); and 3) the logistical difficulties of traveling to rural areas during winter in Siberia. In phase one (fall 2006), I documented the educational methods used by CEE/ITT through interviews with program staff and a review of their training materials and programs. I also made initial site visits to six schools for the purpose of investigating the impacts of CEE/ITT program participation on the teachers involved in the programs. I conducted six interviews with CEE/ITT program participants and observed two CEE/ITT training sessions. Interview questions focused on the participants' educational experiences in CEE/ITT programs, impacts and outcomes of these experiences, benefits of the program, and further educational goals. CEE staff assisted in the identification of research participants by providing contact information for past program participants.

In phase two (spring 2007), I conducted interviews with 10 teachers at three schools visited in fall 2006 and interviews with 8 teachers at three additional schools, an ecology education center, and a children's' creative center. During this phase, I conducted in-depth interviews with eighteen participants.

Significance of the Study

This project is significant because it provided documentation of the impacts of professional development activities centered on educational technology on teachers and classroom practice in a previously unexamined context. These activities have the potential to facilitate perspective transformation among adult learners, which in the case of teachers could lead to institutional change in the educational system (King, 2002). The CEE/ITT program could provide an effective model for not only enhancing the capacity of teachers and rural schools, but also on how to facilitate societal transformation in the classroom and possibly at the institutional level in other locations in Russia and in other parts of the world.

Transformative Learning Theory, the framework chosen for this project was developed in a Western democratic context. It is a broad, general model of how adults

make meaning of their experiences and how this process impacts their perspective and worldview (Mezirow, 1996). Given that the Russian Federation is an emerging democracy, investigating perspective transformation in school teachers in this locale can be of particular interest to the field.

Limitations of the Study

I had many limitations as a researcher from America conducting research in Russia. There is a very small number of Americans who have ever traveled to the Altai Republic. Many of those who do so are part of university exchanges or are tourists and have limited opportunities for interacting with local people. In the rural areas in which I traveled, I was the first American that most of the local people had ever met. In one instance, I was the first native English speaker that an English language teacher had ever met in over thirty years of teaching. In this setting, the bulk of what people know about Americans and the U.S. is learned from what they see on television, either in the news that is reported to them by the Russian media or from American movies and television programs broadcast by Russian networks. This is at best a very skewed picture of what an American really is. This situation is even more difficult now because of the current global political situation (i.e., U.S. war against Iraq, rising tensions between the U.S. and Russia over Iran and China). In order to gain the trust of teachers in these settings, I had to break down barriers created by the history between these two countries. Past experience in gaining trust in both this setting and similar community settings in the U.S. had taught me that the best way to do this is to spend time in the setting interacting with people. It is necessary to give people the opportunity to get to know me and for them to share information about their lives at their own pace and comfort level. This is usually best done in an informal setting. At each site I made return trips when possible, which gave us time to get used to one another. On three occasions, I made presentations in high school classes discussing my life in Kansas and past work between universities in Kansas and the Altai. This is also why I conducted the field research period into two phases. In phase one, I worked on gaining trust with teachers at several different schools. During phase two, I was able to meet with a wider variety of teachers and administrators at several schools. Given that perspective transformation is a very personal and emotional

experience, my ability to access the kind of information needed to accurately assess whether or not it has occurred was limited by the amount of trust I was able to build with participants.

I was also limited by language. While I continuously work to improve my Russian language skills, they were in no way adequate to the task of conducting interviews with native speakers. I used university trained interpreters during formal interviews and observations. However, my language skills enabled me to participate in informal conversations with potential research participants and to demonstrate understanding of their comments during interviews, which also helped to build trust. Prior to beginning the interviews, I worked with my interpreters to acquaint them with the purposes of the research, the interview protocol, and the informed consent form. To ensure that the interpretations were correct, two different interpreters reviewed the transcripts in English and Russian.

Definition of Terms

Transformative learning theory (TLT) is the process by which the worldviews of individuals, groups, and organizations are changed as a result of educational activities. TLT is focused on “how we learn to negotiate and act on our own purposes, values, feelings and meanings, rather than those we have uncritically assimilated from others—to gain greater control of our lives as socially responsible, clear-thinking, decision makers” (Mezirow & Associates, 2000, p. 8). The outcome of transformative learning is perspective transformation.

Perspective transformation is the process by which one becomes critically aware of how and why our assumptions shape our perceptions, understandings, and feelings about the world. As a result of perspective transformation, one’s understanding of the world and one’s role in it becomes more inclusive and future actions are guided by these new perspectives (Mezirow & Associates, 2000).

Educational technology application is the use of computers, software, the Internet, and multimedia in teaching and learning. It is the integration of teaching methodology with computer technology in educational settings to facilitate learning (King, 2002).

Participatory democracy is a form of democratic governance in which the involvement of citizens in decision-making is an institutional element.

Professional development is education undertaken by practicing professionals to enhance their current skills through the acquisition of new knowledge.

Meaningful professional development must go far beyond learning to use a new piece of software or a new trick for increasing student participation. It must involve educators as whole persons—their values, beliefs, and assumptions about teaching and their ways of seeing the world. (Cranton & King, 2003)

Knowledge transfer refers to the processes by which knowledge is shared and disseminated among and between individuals, groups, and institutions.

Classroom practices are the methods used to instruct learners in formal educational settings. These shape and determine what is taught and how it is incorporated into content areas, tasks and assignments, and delivery methods.

Educational philosophy refers to the guiding principles affecting what, why, and how something is taught in educational settings. According to Merriam and Brockett (1997) educational philosophies provide guidelines for decision-making, affect curriculum development and instructional methods used, aid the process of making contributions to the field, and unite theory and practice. One's educational philosophy answers such questions as what is the role of the teacher and learner, who can create knowledge, and what is the purpose of education?

Self-directed learning refers to a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes (Knowles, 1975)

Chapter Summary

Russia is a country in flux, transitioning from a totalitarian state into a democracy reflective of its unique ethnic composition, geographic context, and history. The Russian educational system is currently undergoing computerization and teachers are learning to integrate educational technology into classroom practice. This study examined the impact

of this type of professional development upon the teachers themselves. Transformative learning theory was used to explore if and how the worldviews and perspectives of teachers is changing with respect to their educational philosophies and classroom practice.

CHAPTER 2 - LITERATURE REVIEW

Designing a project about the potential perspective transformations occurring in Siberian teachers as they learn to integrate educational technology into their classroom practice requires a description of the social, political and educational contexts in which these teachers work. Following is an overview of the research setting, the Altai Republic; the Soviet educational system; and the social, political and educational changes in Russia since the dissolution of the Soviet Union in 1991. The theoretical framework used to analyze the data collected for this project was Transformative Learning Theory (TLT). This chapter also provides an overview of the major tenets of TLT, practical and theoretical research on the theory, and how it has been used to examine the experiences of Western teachers as they integrate educational technology into classroom practice.

The Altai Republic

The setting for this research project was the Altai Republic. The Altai Republic is an autonomous republic of the Russian Federation, located in southwestern Siberia just north of the nexus of China, Mongolia, and Kazakhstan. It is home to a population of approximately 200,000 ethnic Russians, Altaians, Kazakhs, and other ethnic identities. The Republic is the homeland of the Altaian people, the indigenous inhabitants of the area, which now comprise approximately one-third of the Republic's population of 200,000. In 2006, the Republic celebrated the 250th anniversary of the Altaian peoples voluntarily joining the Russian Empire. In 1991, the Altai Republic emerged as a semi-autonomous republic during the reconfiguration that followed the collapse of the Soviet Union.

The Republic is situated in a mountainous ecosystem with a highly varied terrain, ranging from rocky alpine outcrops to densely forested taiga. Herding is one of the main economic activities in the republic and many indigenous Altaians maintain their traditional semi-nomadic lifestyle. In the past few years, tourism has increased and is viewed as a potential area for economic development.

Since the introduction of *perestroika* in 1985 and the dissolution of the Soviet Union in 1991, the Russian Federation has been in the process of transforming itself from a repressive, totalitarian regime into a democratic society, although political events in recent years seem to have eroded Russia's progress toward democracy. Since the collapse of the Soviet Union, the Altai Republic had been an independent republic responsible for electing its own governors and representatives. In 2006 the Altai Republic lost this status, along with several other Russian "states", as their elected governor was replaced with one appointed by Vladimir Putin, president of the Russian Federation. This governor is not a local citizen of the Republic, but is the former head of the *militsiya* (police force) in neighboring Altai *Krai* (territory). Most of the Republic's administration has been replaced with staff also from the Altai *Krai*. Formerly these positions were held by Altai Republic citizens. At the time of this writing, no one in the Altai Republic had spoken out or demonstrated against these changes as it would be seen as a direct challenge to the president, which is viewed as a dangerous thing to do. There is discussion within the government of merging the Republic into the *Krai*, which is the configuration that existed during the Soviet era. A grassroots organization has formed to protest and prevent this idea from being implemented. This group has held public meetings in the city square and other events to focus attention on this issue.

Within this political environment, there exists the Center for the Evaluation of Education (CEE), a program of the Ministry of Education whose official goal is to improve the educational experiences of the Republic's high school students, so that when they move to Gorno-Altai, the capital city, to attend university, they are not less prepared than their local counterparts. This is accomplished by helping school teachers to integrate educational technology into their classrooms. The project's director reported that the project has the informal goal of teaching "teachers to have more freedom, so students have more freedom, too. We teach teachers to have fewer limitations, to solve problems so they can do more than they think" (Transcript 26, personal communication, August 19, 2005). So in this time of shrinking political freedom for Russian citizens, this program in remote Siberia is seeking to expand the freedom of teachers in what and how they teach their students.

Education in the USSR

Historical Antecedents

An overview of education in the Soviet Union prior to *perestroika* can be organized into three distinct phases: early post-revolutionary, Stalinist, and post-Stalinist (Jones, 1994; Sutherland, 1999). In general, the education system during the Soviet period was viewed as a mechanism for controlling society. The system served not only as a means for industrializing the country, but for the promulgation of Soviet ideology (Jones, 1994). During this time, the purpose of education was to create individuals suited to serve the needs of society (Jones, 1994). Although the Soviet system of education has been largely standardized, centralized and traditional since the Stalinist era (Gerber, 2000), there were a variety of subtle differences in the approaches and philosophies guiding the educational system during the different phases of the Soviet era, which are described below.

Early Post-Revolutionary Phase

During the early post-revolutionary phase (1917-34) the basic principles of the educational system were established, including ownership by the people, schooling free of charge, and access for both sexes. In addition, “the whole system from kindergarten to university was to provide one unbroken ladder of basic, free, compulsory, secular and undifferentiated education” (Sutherland, 1999, p. 7). Some revolutionary educators were heavily influenced by Western philosophers and educators, most notably John Dewey. “In the 1920s, Dewey was the recognized idol of the Narkompros¹ and Soviet educationalists. Soviet schools had to work ‘according to Dewey’” (Sutherland, 1999, p. 10). This was a time of liberalism and experimentation. Although financial and infrastructure difficulties prevented the widespread implementation of the early post-revolutionary educational reforms, revolutionary reformers viewed the purpose of education as the means for fully developing learners for their participation in the continuing revolution. The school was a political institution and educational experiences

¹ The People’s Commissariat of Enlightenment, which controlled primary, secondary, and higher education beginning in 1917.

should focus on learning by doing and not on traditional rote methods of teaching (Sutherland, 1999).

Stalinist Phase

During the Stalinist period (1930s-50s), the educational system became the uniform and rigid institution by which it is typically characterized (Jones, 1994; Sutherland, 1999; Gerber, 2000). It was during this period that adherence to Western thinkers such as Dewey fell out of favor and classroom practice returned to traditional rote forms of learning and teaching. Education became even more rigidly undifferentiated, with no individual approaches or accommodations allowed in the classroom. The incorporation of Soviet ideology into the curriculum was instituted during this time. There was also a shift away from the general education provided to all citizens and the development of stratified education for students destined to become different types of workers (industrial training versus higher education). Ironically, this division was reminiscent of pre-revolutionary education (Sutherland, 1999). Education during this time employed the social-pedagogical model of personality-oriented instruction (Iakimanskaia, 1995). In this model, society predetermines the appropriate qualities of the individual and the task of the school is to develop these qualities in individuals. “Personality was understood to be a kind of standard phenomenon, an ‘averaged’ version.... This accounted for the principal [sic] social requirements of the personality: subordination of individual interests to social interests, conformism, obedience, collectivism, and so forth” (Iakimanskaia, 1995, p. 7).

Post-Stalinist Phase

The post-Stalinist period (1950s-80s) maintained the focus on ideology inherited from the Stalinist period (Jones, 1994; Sutherland, 1999). However this period was characterized by a slight shift away from the highly undifferentiated system which began in the early post-revolutionary phase (Sutherland, 1999). Special schools for the training of workers from highly skilled and specialized professions, such as physics and mathematics and foreign languages, were developed during this phase. While rigidity and standardization in education was still the norm, there was a lessening of this beginning in this period.

Khrushchev's school reforms of 1958, as well as the various attempts in the 1960s and 1970s to place more emphasis on the individual rather than the collective in school, and to teach children to think and reason rather than to learn entirely by rote, had helped. (Sutherland, 1999, p. 17)

Education during this phase employed the subject-didactic model of personality-oriented pedagogy (Iakimanskai, 1995). Under this model, subject-differentiation was used to provide an individual approach to instruction. "Knowledge was organized on the basis of degrees of its objective difficulty, novelty, level of integration, rational techniques of assimilation, 'dosages' of material, complexity of processing, and so forth" (Iakimanskai, 1995, p. 8).

General Characteristics of Soviet Education

Despite the different phases of the Soviet era, there are some general characteristics that existed throughout its seventy year history. Throughout the Soviet period, education was viewed as the duty of Soviet children to prepare themselves to carry out their obligations to the USSR. Education was not a right, but a gift from the state and the state "exercised rigid control over the creation of the conditions that enabled children to have the opportunity to do their duty to society" (Lebedev, Maiorov, and Zolotukhina, 2002, p. 7). Upbringing (socialization) was and remains even today a strong element of the educational system (Sutherland, 1999; Professional, 2000; Roundtable, 2006; Iakimanskaia, 1995). "Traditionally, the educational process was described as the teaching-upbringing process...All efforts were directed toward the organization of the latter, because it was believed that the child could develop only under the direction of specially organized pedagogical influences" (Iakimanskaia, 1995, p. 7). During the Soviet era, upbringing focused on the transmission of ideology. As such, a significant amount of time was spent on this topic. Not surprisingly, teacher training was more focused on ideology instruction and subject centered learning. Pedagogical training was deemphasized in teacher training curriculums (Webber and Webber, 1994). This was due to the "teacher's role in the vanguard of bringing the Communist faith to the rising generations" (Webber and Webber, 1994, p. 237).

The Soviet school curriculum placed comparatively little emphasis on the development of pupils' cognitive skills but rather required them to memorize the material given to them and reproduce it during examinations. The teacher was seen as a 'subject-teacher' who would act mainly as a purveyor of specialized knowledge. (Webber and Webber, 1994, p. 237)

Soviet schooling trained students in "readymade solutions to value-oriented problems, thus enabling school graduates to adapt to established ideological conditions..." (Lebedev, Maiorov, and Zolotukhina, 2002, p. 27). In this system, teachers were forced to rely on the chronological age of the student and ignore developmental stages and individual distinctions (Jones, 1994).

Perestroika

The policies of *perestroika* and *glasnost*' as strategies to facilitate change in the Soviet Union were announced by Mikhail Gorbachev at a plenary meeting of the Communist Party in the month following his election as the General Secretary of the Central Committee of the Party (Holmes, Read and Voskresenkaia, 1995). There were five categories of reform under the Gorbachev plan: 1) *glasnost*' (openness), 2) decentralization in state economic management, 3) economic privatization, 4) economic marketization, and 5) democratization (Eklof, 1989). Although reform had been part of the political landscape of the Soviet Union for decades, Gorbachev's reforms were the first to encompass a wide range of interlocking systems and to be conducted under public scrutiny (Eklof, 1989). These reforms led to changes in all sectors of society. The media became more open, political parties developed and diversified, politicians were elected by the public, more people could travel and move about more freely, property and businesses became privatized (Eklof, 1989). These changes had devastating effects as well, as economic crises led to unemployment and/or non-payment of wages, an increase in crime, and tension and disruption in many families (Sutherland, 1999).

Gorbachev's purpose was to reform and resuscitate the Soviet economy without completely changing the government (Desai, 2005). However the process began by Gorbachev escalated into a movement to overturn the existing government, led by Boris Yel'tsin and his reformers. Yel'tsin was elected president by popular vote in 1992 and the

constitution of the Russian Federation was adopted in 1993. Under Yel'tsin, expanded election procedures were implemented and privatization moved forward more rapidly. In 1993, the Russian economy had a four-digit inflation rate and the economy (and society) experienced periods of intense crisis and turmoil.

In 2000, Vladimir Putin, a former KGB employee, was elected president. Putin's policies sought to consolidate state power and authority at a time when the public was craving order and stability (Desai, 2005). Although a strong proponent of a free market economy, Putin has used the strong presidential powers granted by the 1993 constitution to return to a system of centralized power. The Constitution of the Russian Federation has a limited system of checks and balances, with a weak legislature and non-independent judiciary (Desai, 2005). The president has the ability to dissolve the Duma (parliament) and can make executive decrees without legislative approval (Carnaghan, 2001). Putin has used the strong office of the president to tighten the reins on electoral freedom (regional governors are now appointed by the president; a switch to proportional, party-based selection of Duma deputies has been announced) and the media (television media in particular is viewed as under the president's control) (Desai, 2005).

Educational Changes

In 1984 the Guidelines for the Soviet School Reform were published, marking the faintest beginnings of educational reform in the Soviet Union as part of the *perestroika* movement heralded by Mikhail Gorbachev's rise to power in 1985, following his tenure as head of the Politburo Commission on educational reform in 1984 (Sutherland, 1999).

Although this reform movement maintained a focus on ideological education and improvements in production, it also called for the development of individuals with better reasoning abilities and for attention to be given to the development of individual personalities (Sutherland, 1999). During the period of *perestroika*, criticism of the educational system (along with criticisms of society's other institutions) were invited by the government. There were many educational innovators who had been dissatisfied with Soviet education and who took the opportunity to discuss their concerns openly. There were many meetings, conferences, and publications actively discussing the problems of the old system and advocating new directions (Sutherland, 1999).

Through discussion, the Gorbachev leadership had been able to co-opt Soviet teachers into the reform process. The heart of Gorbachev's 'reform of the reforms' thus was the creation of a 'loyal opposition' among teachers that would provide him with feedback—and eventual support—to force through a thorough restructuring of schooling. (Hudson and Hoffman, 1993, p. 258)

There was an ensuing struggle between innovative and vocal teachers who were promulgating radical changes and the conservative educational research institution, the Academy of Pedagogical Sciences (Sutherland, 1999). This led to the creation of the Temporary Scientific-Research Collective 'School-1', which had the goal of devising educational models that would facilitate the development of "independent-thinking, initiative-taking workers and professionals needed to carry out the economic and social changes of perestroika" (Hudson and Hoffman, 1993, p. 258).

The main purpose of reform in education was to make it more democratic (one of the five aims of *perestroika*). In practical terms, this meant more active involvement of students in the learning process, more choices for students in the kinds of classes they take, a stronger role for teachers in curriculum decisions, and involvement of parents in school activities (Jones, 1994). "The innovation movement's major aim was to make education more 'student-centered' and to develop cooperation between teachers and students" (Jones, p. 7). This also resulted in increased opportunities to provide more individually-based instruction than ever before (Jones, 1994; Sutherland, 1999). One of the outcomes of new educational practices theorized by the aforementioned 'School-1' collective was the notion that teachers would stop seeing students as objects in the learning process, but as subjects capable of collaborative work with teachers (Hudson and Hoffman, 1993).

Widespread educational reform, although supported by the highest levels of government leadership, was still slow in coming, hindered in part by the desperate circumstances and conditions found in schools throughout the country (Jones, 1994; Sutherland, 1999; Gerber, 2000). The salary of teachers was (and remains) very low, despite increases in educational salaries during the 1980s; inflation resulting from economic turmoil offset gains in this area. Schools also faced crumbling infrastructures and many schools did not have central heating systems, running water, indoor toilets or

gymnasiums (Jones, 1994; Sutherland, 1999). Spending on education had decreased drastically from World War II to the beginning of *perestroika*. “In 1950, it was 1.6 percent (of the national income), and in 1981 it was 0.8 percent” (Sokolov, 1995, p. 40). During *perestroika*, increases in educational spending were authorized, but the Ministry of Education was slow to allocate and distribute the funds to schools (Sutherland, 1999). Subsequent to the dissolution of the Soviet Union, funding for education became even more restricted due to economic crises, thus slowing down development and reforms.

Post-Soviet Educational System

The collapse of the Soviet Union in 1991 and the ensuing economic problems facing the Russian Federation in the 1990s created serious problems for the educational system. In the face of practical difficulties, such as a lack of finance; crumbling infrastructure; administrative chaos; political in-fighting; increasing crime, poverty, and drug use among students; and low morale among teachers (some of whom were not paid for long periods of time), significant progress toward reform goals floundered (Gerber, 2000). As the economy has grown stronger in Russia, more funds have become available for education and the situation has improved. Many of the same problems exist as in the 1990s, but they have been eased somewhat. Since 1992, financing of schools has been largely given over to the budgets of municipal entities, thus the financial solvency of schools is now tied to the economic strength of their local economies (Gur’ianova, 2006).

Attitudes toward Education

Changes in the economic structure of the country lead to a devaluing of education on the part of the public and decreases in enrollments at the levels of secondary and higher education in the early 1990s (Gerber, 2000). This trend, however, appears to be reversing based on more recent research. There has been a shift among young people, who

are more and more coming to understand that having an education, a specialty, and qualifications represent capital to be invested. Success in becoming included in the process of social differentiation is determined by going through the formal and organizational structures of the institution of professional education.

(Zborovskii and Shuklina, 2005, p. 33)

In addition to a return to valuing education, young people also perceive a need to be flexible and adaptive in their future professions (Zborovskii and Shuklina, 2005).

Upbringing in the New System

Like the Soviet educational system, upbringing or socialization is still an important and much discussed aspect of a student's education. The difference is that upbringing is now seen as the process by which a person develops the skills for self-determination and self-realization (Professional, 2000). Upbringing today recognizes a plurality of viewpoints (regional, social, cultural, ethnic); the need for a democratically managed upbringing system; and support for family systems. Much like during the Soviet era, upbringing is a directed activity, but with the purpose of helping students find their way in life leading to the self-realization of the individual, according to his or her own worldview, not the predetermined view of the government. However, the government and educational institutions are still very important sources of upbringing of future generations and are seen as playing a strong role in helping individuals realize their own individuality (Professional, 2000). Students are now viewed as having a role in their own upbringing. Interpersonal relations between the student and teacher are important, pointing to a change in the role of the teacher. The teacher is no longer only a provider of information, but a guide on the path to self-determination.

Differentiation Trends

The strict undifferentiation of schooling under the Soviet system is no longer employed in the current educational system in Russia. A wide variety (and a larger number) of different types of schools have developed, including specialized schools (emphasizing such topics as foreign languages, sciences or humanities), technical schools, gymnasiums and lyceums (Sutherland, 1999). These types of schools are more prevalent in urban areas. There is less possibility for this type of differentiation in rural areas, although the standardized approach to development of rural schools has been replaced with a regionally differentiated approach, which takes local context into account (Gur'ianova, 2006).

In today's educational system, differentiation within the classroom experience is becoming the norm. There is a high level of interest and concern for the individual in the

educational arena. Young people's renewed interest in education is driven largely by their desire for individual gain (Zborovskii and Shuklina, 2005) and current pedagogical practice is supporting this "reorientation, focusing on the idea that education should primarily enable one to be successful and be in demand in the labor market" (Maksakovskii, 2006). Some researchers characterize the changes in education as being an ideological shift from duty to individual rights (Lebedev, Maiorov, and Zolotukhina, 2002).

Curriculum Issues

Curriculum under the new education system is different from the Soviet system in many respects. Curricula and educational materials have become more diverse and more local control is possible; but financial and infrastructure issues make utilizing this control difficult (Kerr, 1995). Soviet ideology is no longer a part of the curriculum, which has been broadened with elective subjects and supplementary (optional) courses. The type of classroom work also provides a broader array of cognitive and value-oriented problems (Lebedev, Maiorov, and Zolotukhina, 2002). Lebedev, Maiorov, and Zolotukhina (2002) criticize the current educational system for its focus on preparation for further professional development and a tendency to emphasize knowledge needed for passing entrance exams.

The opening up of the control over the curriculum has also led to an overabundance of textbooks from which to choose. "The 'orgy of democracy' is also reflected in the transition to a *diversity of textbooks*, which is unquestioningly essential, so that instead of 120 textbooks, there are now 1,200" (Maksakovskii, 2006). Despite the explosion of choices in textbooks, schools are still faced with a lack of information and materials in the school library. A survey of school students indicated that "the need for library services is quite high: this was indicated by 89.2 percent of respondents. In addition, 60 percent of respondents say that there are clearly not enough books in their school library" (Lebedev, Maiorov, and Zolotukhina, 2002).

Despite the changes in the educational system, there is a problem of students not attending class. Lebedev, Maiorov, and Zolotukhina (2002) reported that many students do not attend classes due to boredom and lack of interest. Teachers have more freedom in

the content taught and methods used, but curriculum revision may still not be very widespread. According to Sutherland,

we are rightly warned that in spite of all the new-found freedoms, the innumerable types of schools, and the many attempts to create freedom of choice, ‘only about 8000 of the 67,000 schools have radically revised their curriculum models, adopting modernized subject syllabi, and restructured themselves’. (p. 169, from Holmes, Read and Voskresenskaia, 1995, p. 317)

Sutherland (1999) cites a lack of change in teacher education programs and training as the likely culprit for the lack of movement in curriculum change.

Computerization of Schools

The 1984 Guidelines for the Soviet School Reform included the goal of computerizing schools (Sutherland, 1999). Progress toward this goal was not begun in earnest until focused funding for such an initiative was developed and implemented under the Putin administration (Wolfe, 2001; Peterson, 2005). In 2000, the Putin administration created the President’s Program for the Computerization of Schools to help fund the placement of computers in educational institutions throughout the country (Peterson, 2005). Each school has at least one computer classroom and there are plans to provide Internet services to each school at no cost for one year. In addition, the Ministry of Education provides competitive grants to schools, which can be used to increase the number of computers and other forms of educational technologies available to schools. The Intel Teach to the Future Program (a global educational initiative of the Intel Corporation) was launched in Russia in 2002 to help support the training needs of teachers as they learn to integrate educational technology into their classroom practice (Intel Corporation, n.d).

Transformative Learning Theory

One way to facilitate perspective transformation in teachers is through professional development opportunities. Participation in professional development activities focused on educational technology is a potentially transformative experience for school teachers in a variety of ways, including helping them to develop learner-centered, constructivist approaches to education (King, 2002). The extent of these transformations

is dependent upon several factors (King, 2002; Mezirow & Associates, 2000). These include whether or not adult learning principles have been employed in the educational activities and the contexts in which the teachers teach. A learning environment which addresses the needs of adults is critical to the transformative learning process. By addressing these needs, such as acknowledgement of prior experience, problem-based learning, and promoting self-directed learning (Knowles, 1980), a safe environment in which adults can question their previously held assumptions and explore new roles is possible. For changes in perspectives and roles to be acted upon, the context in which these adults operate must allow room for further exploration and implementation (King, 2002; Mezirow & Associates, 2000; Freire, 1970).

Transformative learning theory (TLT) was used as the framework for investigating any perspective transformations related to educational practice that school teachers in the Altai Republic may be experiencing during the process of learning educational technology. TLT emerged less than thirty years ago and was initially developed by Jack Mezirow during his work on women returning to college (Cranton, 1994). According to TLT, the driving purpose or overall goal of the human mind is to make meaning out of experience. TLT also recognizes that there is no fixed truth or knowledge. All meaning is embedded in the context of how we know it (Mezirow & Associates, 2000). TLT is intended as “a comprehensive, idealized, and universal model consisting of the generic structures, elements, and processes of adult learning. Cultures and situations determine which of these structures, elements, and processes will be acted upon and whose voice will be heard” (Mezirow, 1994a, p. 222). The following section on TLT provides a definition of the theory, examines its theoretical underpinnings, discusses the process of perspective transformation, and gives an overview of previous research conducted using this framework.

Defining Transformative Learning Theory

Basically, transformative learning theory (TLT) is the process by which the worldviews of individuals, groups, and organizations are changed as a result of the adult development process. TLT is focused on how we make meaning and “how we learn to negotiate and act on our own purposes, values, feelings and meanings, rather than those

we have uncritically assimilated from others—to gain greater control of our lives as socially responsible, clear-thinking, decision makers” (Mezirow & Associates, 2000, p. 8). It is thought that these new or transformed perspectives or worldviews will be more complex than previously held ones and that they will acknowledge a pluralistic view of reality.

Theoretical Underpinnings of TLT

Mezirow draws on the work of German philosopher Habermas to support some of his assertions (Mezirow & Associates, 2000). Habermas wrote about three different kinds of knowledge (1971) or domains of learning (1984): instrumental or technical, communicative or practical, and emancipatory. Instrumental learning is concentrated on objective, empirical knowledge derived from the scientific method. Instrumental learning is concerned with “learning to control or manipulate the environment or other people, as in task-oriented problem solving” (Mezirow & Associates, 2000, p. 8). Communicative or practical learning is concerned with “the understanding of ourselves, others, and the social norms of the community or society in which we live” (Cranton, 2002, p. 64). The communicative domain is the domain in which we learn to interpret the meanings behind words. To be able to assess the meaning or intent of someone who is communicating or sharing knowledge, one must have the capacity to critically reflect on the assumptions held by the source of the information. Emancipatory learning is concerned with critical reflection and is the domain of learning in which we learn to free ourselves from constraints placed on us by uncritically assimilated assumptions and expectations (Cranton, 2002). “Emancipation is from libidinal, institutional, or environmental forces which limit our options and rational control over our lives but have been taken for granted as beyond human control” (Mezirow, 1981, p 5).

According to Mezirow (1981) transformative learning is situated in the domains of communicative and emancipatory learning with perspective transformation itself being equated with emancipatory learning. Mezirow derived early versions of TLT from his work with re-entry programs for women returning to college. This research was conducted using “methods of inquiry and criteria for assessing alternative interpretations” (Mezirow, 1981, p. 5), which Mezirow situates in the communicative domain.

Emancipatory learning focuses on self-knowledge and helps us to be able to critically reflect on the assumptions and meanings we encounter in the communicative domain, freeing us to develop alternate or new perspectives and undertake the actions necessary to integrate these newly-formed perspectives into our lives.

The Process of Perspective Transformation

While many theorists and practitioners (Brookfield, 2000; Clark and Wilson, 1991; Cranton, 1994; Tennant, 1993) agree that transformative learning is not a neat, linear process, several key phases have been delineated. They are:

1. A disorienting dilemma;
2. Self-examination with feelings of shame or guilt;
3. A critical assessment of epistemological, sociocultural, or psychological assumptions;
4. Recognition that one's discontent and the process of transformation are shared and that others have negotiated a similar change;
5. Exploration of options for new roles, relationships, and actions;
6. Planning a course of action;
7. Acquisition of knowledge and skills for implementing one's plans;
8. Provisional trying of new roles;
9. Building of competence and self-confidence in new roles and relationships; and
10. A reintegration into one's life on the basis of conditions dictated by one's new perspective (Mezirow, 1991).

Transformative learning processes are thought to be initiated by a disorienting dilemma or trigger event. This dilemma is usually an unexpected event that leads one to discomfort or perplexity. Originally conceived of as a singular event, subsequent exploration has led to the disorienting dilemma as also being viewed as a series of smaller events that may result in the initiation of transformative learning (Cranton, 1994). Disorienting dilemmas can be positive (such as finishing a large undertaking) or negative (such as the loss of a loved one). Larger societal and political events, such as the collapse of a government, can also serve as triggering events (Cranton, 1994). Feelings of shame

or guilt sometimes follow the disorienting dilemma, followed by a period of questioning and exploration of new ideas and perspectives. Critical reflection is a key component of the transformative learning process and the work of Stephen Brookfield (1987, 1995) supports this element. Rational discourse is also seen as a key requirement for transformative learning to occur. This is necessary because Mezirow asserts that it is important for learners to have a safe and respectful environment in which to question previously held beliefs and to explore new ideas and roles. Dialog is also important in that it is one way in which learners can connect their experiences with others and develop the recognition that others have had similar experiences (Mezirow's step 4). The result of transformative learning processes should be the development of alternative perspectives, which are more broadly based, inclusive and complex than those previously held (Mezirow & Associates, 2000). These alternate perspectives should be integrated into one's life, resulting in change and/or action of some kind (Cranton, 1994). These actions and changes may take place in a personal arena or involve social action.

Example of Transformative Learning

There are many examples of transformative learning occurring in a variety of settings (Cranton, 1997; Mezirow & Associates, 2000). Cohen (1997) gives us an example of adult college students transforming their perspectives on their own intelligences during an English course entitled 'Communication on the Job.' This course was designed for vocational students and Cohen found that many had assimilated assumptions about their intelligence based on their previous experiences in the educational system. Many students reported past teachers telling them directly or insinuating that they were not smart and that they had been tracked into vocational education early in their educations (Cohen, 1997). Cohen used the opportunity presented by this class to engage his students in transformative learning. He engaged his students in critical reflection on intelligence as part of their classroom activities. His intent was not to sway his students from their vocational careers, but for them "to know they could do whatever they chose to do. They had the right to see themselves as freely choosing their vocational profession, rather than feeling forced into it by a perceived lack of intelligence and ability" (Cohen, 1997, p. 64). The students worked in small and large groups to

redefine for themselves the concept of intelligence from one previously held assumption to a multifaceted and complex view. The students then reflected on their own past educational experiences, which led them to question their previously held assumptions about their own intelligence. The group then moved on to an analysis of their previous jobs and what kinds of intelligences and complexities were necessary in order to perform them. This resulted in the students redefining their concepts of manual labor. “Students took command of their former occupations, and through a mutual critical examination of their skills, they found the intelligences inside their jobs and inside themselves” (Cohen, 1997, p. 66). The students then had to move to the phase of transformation where they had to personally reassess their own lives in light of their transformed perspectives. Cohen (1997) reported that this was a difficult phase as it required students to now assume personal responsibility for their lives, rather than leaning on their previous assumptions of personal inadequacy.

Meaning Structures: Perspectives and Schemes

A key concept in understanding how perspective transformation occurs is related to the concept of meaning structures. One’s meaning structure or frame of reference is comprised of both meaning perspectives and meaning schemes (Mezirow, 1994a, 1996). Meaning perspectives are “broad sets of predispositions resulting from psychocultural assumptions which determine the horizons of our expectations” (Mezirow, 1994a, p. 223). They serve as sets of codes (sociolinguistic or sociocultural, psychological, or epistemic) that shape our perceptions, feelings, and cognition. Examples of one’s meaning perspective include social norms, ideologies, personality traits, or learning styles (Mezirow, 1994a). Meaning schemes are concrete expressions of our meaning perspectives. A meaning scheme is the “constellation of concept, belief, judgment, and feeling which shape a particular interpretation (e.g., when we think of abortion, black people, the Muslim religion, free market capitalism, or liberalism)” (Mezirow, 1994a, p. 223). Figure 2-1 below shows the relationship of meaning perspectives and meaning schemes.

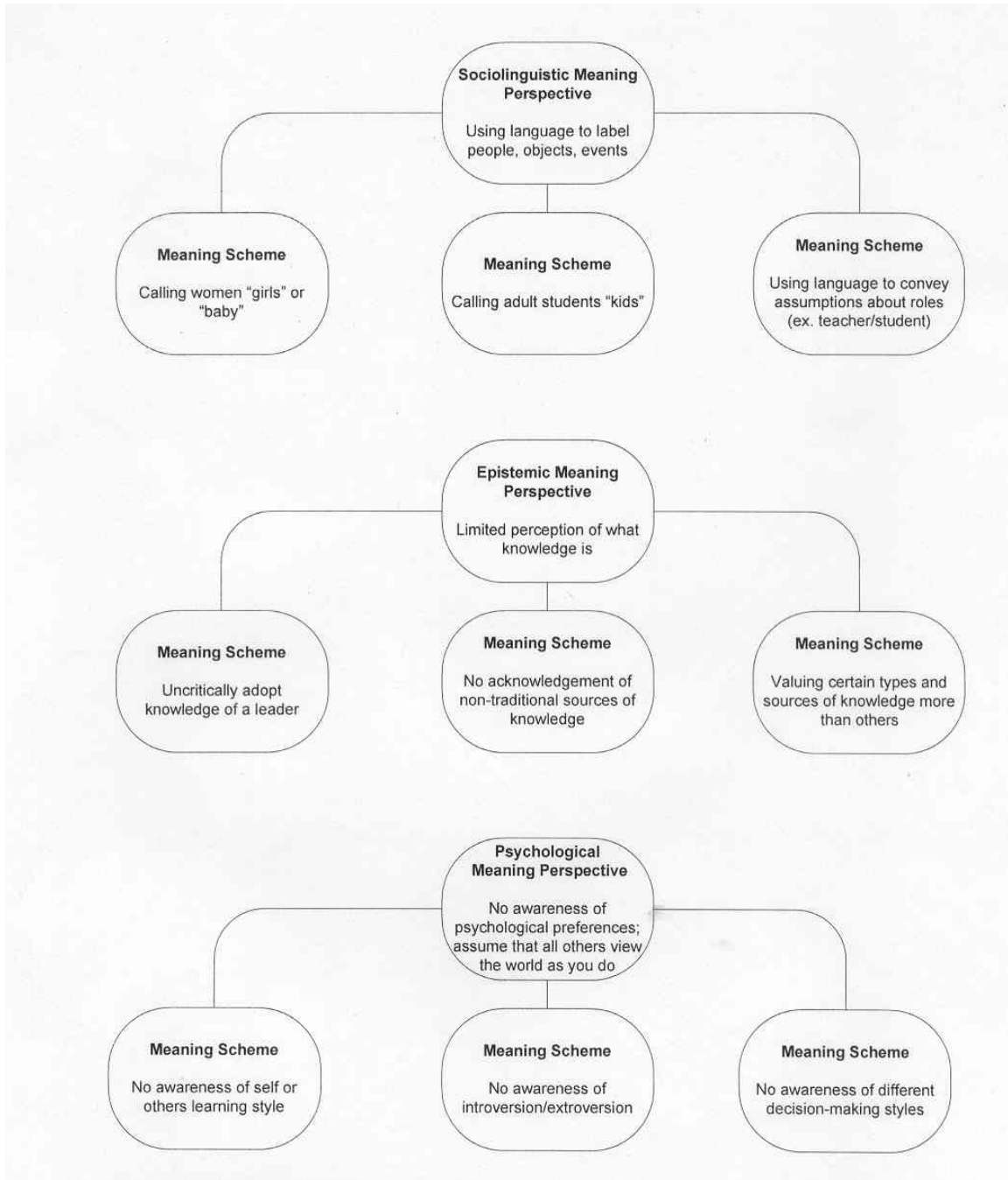


Figure 2-1. Sociolinguistic, epistemic and psychological meaning perspectives and their related meaning schemes.

A meaning perspective is a broad (pre)conception comprised of several different meaning schemes. One example of an epistemic meaning perspective is someone who has a limited perception of what constitutes knowledge and who can be a creator of knowledge. This perspective is constituted (and supported) by a number of meaning schemes. These meaning schemes serve as a foundation for or a specific expression of the larger, broader meaning perspective. In this scenario, meaning schemes which support a limited perception of what constitutes knowledge and who can create knowledge could include unquestioningly accepting information from an authority (such as a leader, church or parent) or refusing to acknowledge the wisdom of non-traditional sources of knowledge (such as children, non-academic sources, or members of a different culture).

Meaning structures are transformed when one participates in reflection. When one experiences a disorienting dilemma, this triggers reflective activity around one's assumptions, beginning the process of transformation of one's meaning structures. Where the transformation occurs (whether in the meaning perspective or the meaning scheme) depends on the type of reflection in which one engages. There are three types or areas of reflection: content, process, or premise. Reflection on content and process result in transformation of meaning schemes, which is a common every day occurrence. These are what and how questions. Reflection on premise results in transformation of meaning perspectives. These are why questions. Engaging in different types of reflection results in different kinds of transformations in one's meaning structure. Perspective transformations can be the result of a major life event (a change in meaning perspective) or the result of several incremental and accumulative events (several changes in meaning schemes). According to Mezirow (1994), there are four ways in which adults can learn: "by refining or elaborating our meaning schemes, learning new meaning schemes, transforming meaning schemes, and transforming meaning perspectives. Reflection of content and process pertain to all, reflection of premises transforms meaning perspectives only" (p. 224).

Toward an Emancipatory Paradigm

Since Mezirow's earliest publications on perspective transformation in 1978, criticism and dialog have helped shaped the theory. In 1996, Mezirow began positioning

his theory of perspective transformation as an emancipatory paradigm representing a synthesis of the rational and cognitive philosophical paradigms shaping Western thought. Learning in the rational paradigm is concerned with events in the objective world.

The most significant learning is that which enables the learner to understand and shape his or her behavior to better anticipate and control the real world. The educational process is to transmit accurate representations of the real world, ideally established as such by scientific test. (Mezirow, 1996, p. 159)

Learning under this paradigm is aligned with instrumental learning as identified by Habermas (1984).

According to the cognitive paradigm, there is no distinction between subject and object and actors or agents bring their own interpretation or truth to any context or experience. “To understand others, one must gain access to their lived experience so as to clarify and elucidate the way they interpret it” (Mezirow, 1996, p. 160). This type of learning is aligned with communicative learning as identified by Habermas (1984).

Transformative learning theory (TLT) represents a synthesis between the rationalist and cognitive traditions as it recognizes the role of both instrumental and communicative learning (Mezirow, 1996).

Knowledge is derived from instrumental learning and scientific inquiry regarding the independent reality of the world and a set of shared subjective, often taken-for-granted interpretations, and a reality created through the process of communicative learning that is socio-culturally constructed through language. Learners need to appropriate the ways in which these different discourses encode different meaning perspectives and schemes. (Mezirow, 1996, p. 164)

Mezirow posits TLT and his attempts to elucidate it as the development of “a general, abstract, idealized model of adult learning” (Mezirow, 1996, p. 166). As such the model does not undertake a cultural critique, but should be viewed as a framework for studying adult learning in a variety of settings and cultures. It is the cultural context which determines how the elements of TLT are utilized in a particular setting. Understanding how context impacts learning requires an understanding of how cultural and social forces influence the meaning perspectives and schemes of a culture’s members, as well as localized concepts of validity-testing and praxis (Mezirow, 1996).

To the extent that contemporary sociocultural forces lead to transformative learning, they permit or encourage critical reflection and rational discourse. These prevailing forces are of major significance to adult learning; they dictate whose voice shall have priority and who is permitted to be heard... The learner brings to the situated learning experience his or her meaning perspectives. (Mezirow, 1996, p. 168)

Culture also impacts the ability of its members to move toward more inclusive perspectives relative to the amount of control it exercises on its members' relationships and the types of relationships valued by the culture. As a culture transitions from one in which organic relationships (family, class, or community based) are more highly valued to one in which contractual relationships (individual-oriented) are more highly valued, this gives more opportunities for members to experience perspective transformation (Mezirow, 1978).

Transformative Learning Theory Research and Practice

According to E. W. Taylor (2000) research on TLT has followed two patterns. One pattern, unpublished doctoral dissertations, is one of the richest sources for empirical research on how TLT has been applied in a variety of adult educational settings at individual, group and organizational levels. The other pattern of research consists of peer-reviewed publications focusing on "theoretical critique on issues of social action, critical pedagogy, adult development, reflection, power, and context and rationality" (Taylor, E.W., 2000, p. 285).

Empirical Research in Adult Education Settings

Examples of how TLT has been used in educational settings include higher education (K. Taylor, 2000; Cohen & Piper, 2000; Gliszinski, 2005; Barlas, 2000), corporate human resources development (Yorks and Marsick, 2000), academic committees (Kasl & Elias, 2000), community education (Waithe, 2005; Silverman, 2004); and professional development for teachers (Dumochel, 2004; Smith, 1999; Saavedra, 1995; King, 2002). Much of this research focuses on how to facilitate transformative learning in specific types of learners in specific educational contexts.

K. Taylor (2000) describes the facilitation of transformative learning in returning adult students in formal university settings as “teaching with developmental intent.” In the examples she describes, learners engage in assignments and classroom activities that encourage critical reflection on their currently held beliefs and assumptions, promote their development as self-directed lifelong learners, and develop a sense of self-agency. Cohen and Piper (2000) describe their use of residential learning communities to facilitate perspective transformations in adult university students. They take advantage of the residential aspects of their program to create a learning environment which challenges the learners’ expectations of traditional educational experiences. Gliszinski’s (2005) study uses qualitative and quantitative methods (a rarity in TLT research) to investigate the capacity of teacher education programs to facilitate perspective transformations in individuals. He examines the extent of these transformations and how they are reflected in the students’ current lives. Barlas (2000) describes the perspective transformations of students engaged in doctoral studies. Emphasis is placed on the linkage between personal transformation and subsequent actions to promote social change.

Yorks and Marsick (2000) describe organizational transformation in corporate and university settings using the frameworks of action research and collaborative inquiry. Examples cited by the researchers are real-world, problem-solving events in which individuals experienced transformative learning through participation in group activities. The organizations involved sought to transform themselves into learning organizations by creating liberating structures and spaces within themselves in order for group members to change their habits of mind and participate in critical reflection.

Although some transformative learning theorists think that individual transformation precedes social transformation (Mezirow, 1990), Kasl and Elias (2000) assert that transformative learning is possible at the group level. It is their belief that “the health and effectiveness of our organizations and communities depend on the capacities of small groups to be transformative learners” (Kasl & Elias, 2000, p. 229). Their work focuses on a case study of an academic committee charged with creating a doctoral program in transformational leadership within their university. Key results from this case study indicate that the lenses through which individual transformative learning are

examined are applicable to group processes. The researchers report that creating new perspectives, norms and frames of reference at a group level is possible.

Examples of transformative learning in community education settings tend to focus on issues related to the environment or health. Silverman (2004) explored the learning processes and transformative outcomes as residents of two Vietnamese communities engaged in projects to protect coastal and marine environments. The projects were managed by two different groups and the community members were involved in different ways. The results of this comparative study indicate that, at least in this setting, collaborative processes result in a higher level of perspective transformation. Waithe (2005) examines the relationship of perspective transformation and behavior change related to health in the context of community coalitions. A key finding in this study is that “building practitioner and learner awareness and understanding of the significance of ways of knowing in transformative learning is essential” (Waithe, 2005, p. vii). According to Waithe (2005), this is a key element in the move from personal transformation to transformation at the community level.

Criticisms of Mezirow’s Transformative Learning Theory

Criticisms of Mezirow’s theory focus mainly on 1) Habermas’ theories and how Mezirow utilizes them, 2) the failure to incorporate a comprehensive theory of social change, 3) context and rationality, 4) the need to differentiate between normal adult developmental process and perspective transformation, and 5) the role of reflection.

Criticisms of Habermas

Collard and Law (1989) criticize Mezirow for his reliance on and use of Habermas’ early theories, which according to Habermas were flawed. One of these flaws concern Habermas’ tendency to collapse two concepts of self-reflection into one – reflection on knowledge and socially constructed reality. Collard and Law (1989) assert that although Mezirow generally utilizes the latter, he occasionally slips into the blended version originally offered by Habermas. To address the problems with his previous work, Habermas shifted from a paradigm of consciousness and cognition to one of language and communication. Mezirow follows this shift, but according to Collard and Law (1989) this too causes problems in the theory of perspective transformation. Mezirow identifies

the ideal conditions for self-directed learning, which according to Collard and Law require relationships of equality. TLT doesn't "acknowledge the difficulty of fostering conditions of ideal learning in a social environment in which structural inequalities are entrenched" (Collard and Law, 1989, p. 105).

Hart (1990) also focuses her criticisms of Mezirow's early versions of TLT on its theoretical basis and on issues of power. According to Hart (1990), Mezirow's theory does not fully incorporate the issues of power and dominance raised by Habermas' work, as he does not critique the "current economic, social, and political arrangements which are inherently tied to these distortions" or disorienting dilemmas (Hart, 1990, p. 127) and fails to address the relationships between categories or domains of learning and distortions. Hart asserts that educators desiring to facilitate emancipatory education should understand these factors and how they intersect and impact learners. For example, Hart feels that an educator who wishes to help a community revitalize their declining neighborhood should have a firm grasp on what social, economic and political factors are operating in that specific context and how they have shaped the current setting and may impact the community in the future. Mezirow's TLT leaves the responsibility for these explorations and connections to the learner.

Mezirow also fails to place power and dominance at the center of his emancipatory theory, which Hart (1990) labels as uneven and non-committal. By relying on Habermas, Mezirow has intrinsically connected his theory to the issues of power and dominance raised by Habermas' work; thus, TLT must deal with these issues (Hart, 1990). "Mezirow therefore presents a somewhat truncated version of Habermas' theory of communicative action, and his use of the categories of "communicative" and instrumental" severs the *systematic* and intrinsic relationship of this theory with a critique of power (and the latter's practical implications for emancipatory action)" (Hart, 1990, p. 127).

Further, Mezirow does not place critique and critical reflection activities within the realm of communicative action. According to Hart (1990), this is where these activities must take place within a theory of emancipatory education, which TLT purports to be. Hart also asserts that there are distortions Mezirow includes in his theory that are beyond the scope or concern of emancipatory education, such as mental illness. She

redefines the types of distortions that emancipatory education should be concerned with as social-cultural, interpersonal, and intrapersonal, viewing these as all interrelated. She also feels that critical self-reflection and ideology critique cannot be separated.

Issues with Social Change

One of the early criticisms of Mezirow's TLT is that it did not present a comprehensive theory of social change, which some critics found to be a severe deficiency (Collard and Law, 1989; Hart, 1990; Cunningham, 1992). According to Collard and Law (1989) the philosophies upon which TLT are theoretically based lack a theory of social change that they find acceptable. They cite the work of Habermas, interactionism, and existentialism as all giving too much emphasis to the individual and are thus not reconcilable with social change theories. TLT is criticized for allowing a high degree of political detachment.

Indeed, Mezirow is never clear about the nature of collective action and the bases on which people come together. At times he argues the need for collective political action; at other times he relegates it to the realm of mere possibility, leaving us with the impression that emancipation can be realized without social action. (Collard and Law, 1989, p. 105)

Collard and Law also take issue with Mezirow's claim that a necessary element of perspective transformation is the taking on of others' perspectives. They identify difficulties in determining exactly who has a more critical awareness, identifying one's own psychocultural assumptions, and delineating the relationships between assumptions and their social origins. They also fault Mezirow for failing to create a critique of dominant ideology. At this point (1989), Collard and Law assert that claims that Mezirow has a theory of perspective transformation are premature.

At best, he presents mere fragments of a theory of adult learning and education or self-directed learning. Further, it is difficult to see how his ideas can be located within the European tradition of critical theory when they are largely devoid of the socio-political critique that lies at the heart of that tradition. (Collard and Law, 1989, p. 105)

Hart faults both Habermas and Mezirow for valuing rationality and cognitive processes over relationships. Emancipatory education should facilitate

theoretical consciousness which is capable of understanding and criticizing individual experience in the light of larger social forces, as well as in terms of bringing to life the richness of individual and social differences, thus producing a desire both to dwell in and appreciate and to transcend these differences in a process of *mutual* understanding. (Hart, 1990, p. 135)

She asserts that caring and relationships among participants in educational processes are components of developing critical abilities.

Hart (1990) agrees with Mezirow that emancipatory education is a form of social action. As such it must situate itself and critique the ideologies and contexts in which it is occurring. This is crucial as “education is always inevitably caught in a tension between leading to new patterns of thought and action via the individual consciousness, and the fact that structures as well as content of individual consciousness are thoroughly permeated by society” (Hart, 1990, p. 136). The emancipatory educator cannot stand “outside” of this context or power-bound situation.

Cunningham (1992) finds Mezirow’s opinion that personal transformation can lead to social transformation problematic.

If one can jettison the issues of economic and cultural power relationships and how meaning and social relations develop from these contexts, one misses the point of why we have ‘dependency producing epistemic or psychic presuppositions’ – these alienated behaviors are *produced* by the structures. This distinction is basic and I believe a fundamental difference in the standpoints of personal verses social transformation. (Cunningham, 1992, p. 186)

Mezirow’s Responses

Mezirow addresses critiques regarding his use of Habermas, the a lack of social change theory and other issues regarding power and social context by asserting that his theory of perspective transformation is centered upon how meaning is constructed through the adult learning process.

I have tried to show how our habits of expectation, which come to serve as meaning structures determining the nature and perception and cognition, often distort our interpretations of experience. Critical reflection of the presuppositions

of these uncritically assimilated meaning schemes and perspectives can lead to individual and social transformation. (Mezirow, 1989, p. 170)

These transformations can be individual, group, or collective. Although social action is necessary, it is not the only goal of adult education. Learners, when they experience perspective transformation, may choose not to take action or may be prevented from taking action (social or otherwise) due to a variety of factors including situational constraints, lack of information, psychological barriers, or a lack of skills. Further, Mezirow states that distortions in meaning perspectives occur not only at the social-cultural level, but also at the epistemic and psychological levels. The outcomes of transformations at these levels may be markedly different. “It is not to ‘psychologize’ or to trivialize the potential for social change implicit in transformative learning to suggest that each of these three dimensions involve different and variable modes of interaction and action” (Mezirow, 1989, p. 173). The relationship between transformation and social action isn’t simple or direct. There are many varieties of both kinds of phenomenon. “Transformative learning experiences which result in changes that are epistemic and psychic may not logically lead to collective action at all and may only very indirectly be a product of specific social practice or institutionalized ideology” (Mezirow, 1989, p. 174). Mezirow views the goals of adult education and social and political action as necessary and important, but feels that they are instrumental learning activities. Their purpose is to facilitate emancipatory learning experiences for adults to enable them to understand their experiences “through free, full participation in critical discourse. Reflective dialogue represents the most distinctively human attribute, the capacity to learn the meaning of one’s own experience and to realize the value potential in nature through communication” (Mezirow, 1989, p. 174).

Context and Rationality

Clark and Wilson (1991) discuss the role of context in perspective transformation, as well as the concept of rational discourse. In terms of context, Clark and Wilson assert that Mezirow’s use of context is limited or generally acknowledged only as it relates to meaning perspectives and changes to meaning perspectives. It is their assertion that individual transformations must be analyzed within the contexts in which individuals are positioned. As an example, they review Mezirow’s research on women reentering

college. They view that this research has been decontextualized in order to make the overall theory of perspective transformation more generalizable. As, for Clark and Wilson, meaning is derived from context, so the decontextualization actually limits the meaning and our understanding of the women's learning and experiences, which could have been analyzed within the contexts of class, structured educational environments, history, and gender.

Clark and Wilson explain that Mezirow's theory does incorporate context into the concept of meaning structures. New meaning perspectives are context dependent. In order to move to more developed meaning structures, individuals must be more aware of and consider issues of context in their newly acquired perspectives (1991).

Context, then, is integral to the structure of the theory. Unfortunately, Mezirow fails to develop the implications of the contextual dimension and goes on to limit the role that context plays in the transformative learning process. As was true in the original study of the reentry women, learning is construed as a psychological process located in the individual, giving primacy to human agency over social context. There is, in fact, no serious examination of the impact the sociocultural context has on that process. (p. 79)

Clark and Wilson further criticize Mezirow's theory for giving psychological processes and individual agency priority over social context. By not developing the contextual dimensions of the theory, it reflects "the humanistic assumption of a unified rational self" (Clark & Wilson, 1991, p. 79). This assumption fails to account for the impact of sociocultural context on the individual. This is tied to classical liberal philosophy, where the individual has control and uncontested agency. Clark and Wilson contrast this view with the poststructuralist idea of contested subjectivity, in which the social-cultural context in which an individual is positioned has a

formative impact on the construction of self. Much of this structuring of the self occurs apart from conscious awareness; it is only when it is brought to consciousness and critiqued that it can be changed. In this model, therefore, human agency is seriously contested by sociocultural forces. (1991, p. 79)

They see this problem as one of balance. By giving more primacy to individual agency, the theory fails to account for the "formative roles of the multiple contexts within which

both the individual and his or her experience is situated and by which it is interpreted” (p. 80). According to Clark and Wilson, such an imbalanced theory is very limited in its scope.

Clark and Wilson (1991) also assert that Mezirow’s theory reflects a specific socio-cultural context and viewpoint, which is not acknowledged by the theory.

Mezirow (1990) reflecting on what he calls the ‘central theoretical assumptions’ of adult educators, lists three things: ‘learner-centeredness, critical discourse, and self-directedness’ (p. 363). We believe these represent the pivotal assumptions of his theory of transformative learning, and further that they reflect, respectively, the hegemonic American values of individualism, rationality, and autonomy. (p. 80)

That these values are embodied and reflected in the theory are not problematic for Clark and Wilson. The problem is that they remain unacknowledged and uncritically examined. A critical examination of the theory’s underlying assumptions would only serve to broaden the theory and aid in its development.

Clark and Wilson (1991) discuss Mezirow’s concept of rational discourse and its evolution in the theory of perspective transformation. In early iterations of the theory, the required conditions for rational discourse were outlined. These included having access to full information, freedom from coercion, equal opportunity to assume various roles, becoming critically reflective of assumptions, openness to different perspectives, and that rational discourse will lead the participants to one correct answer based on the current information available (Mezirow, 1997). In later iterations, Mezirow acknowledges that these conditions are ideal, a goal to strive toward, but are not often realized (Mezirow, 1996). Ideal conditions for discourse can not be attained as “historical, hierarchical, ideological, institutional, and psychological restraints distort the process of discourse in everyday life” (Mezirow, 1985, p. 19). Where Mezirow sees these elements as distorting, Clark and Wilson (1991) view them as the essential elements of context which provide meaning. Rationality (and scientific meaning) are also bound by cultural context. Clark and Wilson propose

an understanding of rationality as theory-laden, value-driven, communally judgmental, and historically situated. We suggest that Mezirow’s theory of adult

learning needs to be more concerned with exploring and understanding the relation between context and meaning rather than seeking to minimize the effects of context on meaning. (pp. 90-91)

Mezirow's response (1991) to Clark and Wilson asserts that his work does not seek to disconnect cultural context from meaning.

I have attempted to show that every belief or perspective, as these are articulated in speech, is not equally functional for interpreting experience and that much of our learning has to do with the process of validating what we have learned or culturally assimilated. (p. 190)

Further, he states that his criteria of rational discourse have been derived from the context in which they emerged. He feels that Clark and Wilson have misinterpreted his intentions with regard to context and rationality. He agrees with Clark and Wilson's assertion that rationality is context bound and views their arguments and evidence as more supportive of his theories than incompatible. Still, he asserts that rationality is a widely accepted construct in modern societies and thus presents acceptable criteria for ideal discourse, although he rejects Clark and Wilson's notion of multiple valid viewpoints. He says that "when an assertion predicated upon a perspective is made, it is validated either empirically or consensually" (1991, p. 191). When this assertion falls in the domain of instrumental learning, it can be validated empirically. When it falls into the domain of communicative learning, validity is determined by consensus, which might recognize the partial validity of opposite views or synthesize multiple perspectives. If consensus is not possible, then people agree to live with their differences or resort to traditional sources of authority for a solution.

Normal Adult Development or Transformation?

Tennant (1993; 1994) explored the need to differentiate between normal adult developmental processes and true perspective transformation. He based his argument on life stages or life cycle theories, which are seen as the normal processes that all adults go through during various stages of their lives. He asserted that although many normal changes which a given adult may experience throughout life may be experienced as fundamental shifts in world view, they are indeed merely "expected life-cycle patterns (e.g. changes associated with leaving the parental home, marrying, having a child)"

(Tennant, 1993, p. 39). Making a distinction between normal life-cycle events and perspective transformation is essential as

much of what is regarded as normal development occurs within a framework of taken-for-granted assumptions about the world. Perspective transformation, however, is a process which challenges these assumptions. As such, it represents a developmental *shift* (a new world view) rather than simply developmental *progress*. (Tennant, 1993, p. 41)

Tennant also seeks to establish a hierarchy between transformations in Mezirow's meaning perspectives and meaning schemes. According to Tennant, transformations in meaning schemes (incremental, commonly experienced transformations) aren't as deep-seated as changes to meaning perspectives (Tennant, 1993). He equates changes in meaning schemes to developmental progress and changes to meaning perspectives as deconstruction of a previous world view and construction of a new one.

Tennant's assertion is that in order for change to be considered true perspective transformation rather than normal adult development, both social and individual factors need to always be present and accounted for in the process (1993; 1994).

In my view, development needs to be understood as an essentially dialectical process, with constant interaction between the person and the social environment. But one needs to acknowledge that the social environment side of this relationship is the more powerful and teachers need to be fully able to discern the social origins of psychological assumptions if they are to be fully explored. (Tennant, 1994, p. 234)

Tennant (1993; 1994) has particular difficulty with the absence of strong social components concerning transformations in the psychic and epistemic areas.

Mezirow's Response to Tennant

Mezirow (1994a; 1994b) disagrees with the need for and legitimacy of distinguishing between changes to meaning schemes and meaning perspectives. The learning process is the same for changes to meaning schemes or perspectives or for transformations regarding distortions in the socio-cultural, psychic, or epistemic areas. Changes in meaning schemes and meaning perspectives are but two alternative paths to transformation: One utilizes incremental change, the other epochal. Because of this, there

should be no reason to have different degrees of relevance between changes to meaning schemes and to meaning perspectives. He also states that transformative learning and adult development are the same processes.

In my view, meaning perspectives and meaning schemes are two dimensions of the same learning process, and the process by which adults learn – through the elaboration, acquisition, and transformation of meaning schemes and perspectives – is the same as the process of adult development. Perspective transformation is the engine of adult development. (Mezirow, 1994a, p. 228)

Mezirow (1994a) responds to Tennant's assertion that social critique is an essential element of transformative learning by reiterating that his purpose is to develop a general theory of adult development and learning, as such every element may not be utilized in every situation or to the same degree. Although there is a lot of overlap between the socio-culture, psychic, and epistemic areas, transformation is possible in the psychic and epistemic realms without extensive social critique.

Transformative learning also takes place in the sciences, arts, mathematics, music, literature, and philosophy – indeed, in every area of adult learning. In every case, awareness of the cultural context shaping our assumptions is important, but it does not necessarily require a critique of social organizations or of society *per se*. (Mezirow, 1994a, p. 228)

The Role of Reflection

Criticism of the role of reflection in TLT is, like many of the criticisms discussed above, connected to social action. Newman (1994) provides a review of how reflection has been used in the past few decades by different adult educators such as Schön; Boud, Keogh, and Walker; and Jarvis. He then discusses how different Mezirow's use of reflection in TLT is from previous theorists. "It is a form of reflection that permits us to see that our views, our identity, even apparently incontrovertible facts, are generated and constructed; and it allows us to examine the form, the nature and the validity of those constructions" (Newman, 1994, p. 239). Newman goes on compare Mezirow's use of reflection in TLT to Friere's use of reflection in conscientization. Newman views the difference as being in the expected result of reflection, less than the process itself.

While perspective transformation involves the development of a critical awareness of the cultural context of the learner, it does not impel the learner actively into the flow of social history in the way Friere argues that conscientization will. In Mezirow's discourse, society can be perceived as essentially stable since towards the end of the process of perspective transformation he gives the learner the option of reintegration. (Newman, 1994, p. 239-40)

Newman goes on to suggest that reflection should not initially be focused on oneself, but on one's enemies and the systems of oppression they generate and perpetuate. Newman appears to have an issue with both Friere's and Mezirow's reliance or expectation of learners to become motivated to take social action on their own behalf and even ultimately freeing their own oppressors, as Friere asserts. He questions the value in identifying and helping the seriously oppressed and disenfranchised to transform their perspectives and then leaving them to complete the actions needed to free themselves on their own. He called for an educational strategy which first identifies and explores the enemy, then moves toward facilitating perspective transformation of the oppressed.

Mezirow's Response

Mezirow's response to Newman's criticism was to reaffirm that TLT is a broad, general model which can be used to examine perspective transformation in a variety of contexts. He also clarified the differences between his theory of transformative learning and Friere's concept of conscientization (Mezirow, 1994b). Mezirow asserted that conscientization is restricted to reflection of the sociocultural codes, whereas TLT extends into the epistemic and psychic codes as well, resulting in a broader framework. This same argument is applied to action as well. Action resulting from perspective transformation is not limited to the sociocultural codes or spheres alone, but can also take place in the psychic and epistemic areas. Mezirow defines social action very broadly and does not limit it solely to collective social action (1994b). Responding to Newman's call for a focus on the oppressor, rather than the oppressed, Mezirow shares this warning:

The activist fallacy of critically reflecting on one's opponents' perspective without focusing on one's own ways of understanding is that, having internalized

the values of your oppressors, you are very apt to become one yourself when you assume power over others. History is brimming with examples. (Mezirow, 1994b, p. 244)

Transformative Learning and Professional Development for Teachers

Educational institutions play a key role in transmitting and sustaining any culture. The society and community in which we live have powerful norms about education and the role of the educator... Today, education may be viewed as a way of promoting good citizenship, socializing people to fit into a profession or organization, providing the building blocks of democracy, improving productivity, cultivating future leaders, and freeing people from oppression. (Cranton & King, 2003, p. 34)

In order for any country to undergo a marked change in its culture, it has to eventually change what its schools do. Similarly, schools themselves can become the mechanism by which a country changes. It is important to examine ways in which transformative learning theory has been applied to professional development of teachers.

Environmental Education

Dumochel's (2004) work focused on intensive professional development for educators in the content areas related to environmental education. Dumochel drew upon past research on transformative learning and adult development to devise her own framework of elements related to making meaning of educational experiences. These included learner receptivity, place, interactions with others, content, shared experiences, and reflection.

Classroom Practice Related to Racial/Ethnic Equity

Smith (1999) provides the only example of research on perspective transformation in teachers that examines the impact of said transformations on classroom practice. Her work explores teacher's perspective transformation as a result of participation in professional development activities intended to produce perspective transformation. The teachers in Smith's study were involved in learning to promote the development of inclusive curricula with respect to ethnic and gender equity. One of the several key

findings of the research was that “as these teachers examine and monitor their own teaching to advocate diversity and difference, they invite their students, as citizens within the school and society, to recognize and challenge systems of power that sustain exclusion” (Smith, 1999, p. x).

Teacher-Led Study Groups

Saavedra (1995) focuses on perspective transformation in teachers as a result of their participation in study groups. The emphasis of this work is on social setting/context and how perspective transformation can be facilitated in this type of setting. Key findings suggest that group transformation occurred in this setting and acknowledge the recursive relationship between context and product whereby “context shapes the activity and talk and in return the activity and talk generate and shape the context” Saavedra, 1995, p. 13).

Integrating Technology in the Classroom

King (2002) has a wide range of experience in delivering educational technology instruction to practicing educators, which led her to realize the transformative potential in this adult education activity. Her work aligns the “journey of transformation” she documented among learners with Mezirow’s transformative learning theory.

Table 2-1. Alignment of King and Mezirow Frameworks

Journey of Transformation (King)	Perspective Transformation (Mezirow)
Fear and uncertainty	1. A disorienting dilemma 2. Self-examination with feelings of shame or guilt
Testing and exploring	3. A critical assessment of epistemological, sociocultural, or psychological assumptions 4. Recognition that one’s discontent and the process of transformation are shared and that others have negotiated a similar change 5. Exploration of options for new roles, relationships, and actions;
Affirming and connecting	6. Planning a course of action

Journey of Transformation (King)	Perspective Transformation (Mezirow)
	7. Acquisition of knowledge and skills for implementing one's plans 8. Provisional trying of new roles 9. Building of competence and self-confidence in new roles and relationships
New perspective	10. A reintegration into ones life on the basis of conditions dictated by one's new perspective

(King, 2002, p. 33)

The “journey of transformation” practicing teachers experience when learning educational technology can lead to changes in the following areas: “emphasis on self-directed learning, use of new teaching methods, incorporation of critical thinking skills development in learning, employment of problem-based learning, preparation and research, and confidence and empowerment of teachers and learners” (King, 2002, p. 40). Not only do these changes align with the results and recommended methods of facilitating TLT (Mezirow & Associates, 2000), but they are reflective of several adult education theories and practices.

Self-directed learning has been defined by many adult educators (Knowles, 1980; Candy, 1991; Brookfield, 1985). According to Knowles (1975) the term self-directed learning describes a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes.

King (2002) reports that as educational technology is integrated into the classroom, practicing teachers become more self-directed as they plan new courses of action based on their new knowledge (Mezirow's step 6) and as they experiment with new methods and roles in the classroom (Mezirow's step 8). Maintaining a current knowledge base in educational technology requires continued learning to stay informed of new developments. For the integration of educational technology in classroom practice to be sustainable, teachers must become more self-directed. It is possible to facilitate the

development of self-directedness in learners (Knowles, 1975; Grow, 1991; Brookfield, 1986) and according to Brookfield (1986) the goal of helping the learner become more self-directed is to support the development of individuals who are critically aware and have the capacity to envision and realize alternative ways of thinking. King (2002) uses personal reflection activities to facilitate an increase in self-directedness on the part of her learners.

King (2002) describes a model of transformation that is evident as teachers incorporate new teaching methods into their courses. Teachers new to educational technology typically begin using it to support and supplement their current curricula. Examples of this are using software to generate a computer created overhead or using e-mail for communication. In the next stage, educational technology is integrated into the curriculum. An example of this is requiring its use by students in completing assignments, such as finding information on the Internet. The final stage is transformation, where course curricula is totally redesigned and reassessed in light of newly developed perspectives on teaching and learning. This is evidenced by “a fundamental reframing of how the teachers approach instructional preparation and delivery” (King, 2002, p. 43). They may create research projects that have no predetermined answer, which requires students to draw on a variety of sources to synthesize a completely new solution to a problem.

The use of educational technology in the classroom, particularly the Internet, creates a need for both teachers and students to become good consumers of information. According to the National Forum on Information Literacy (2006), “information is expanding at an unprecedented rate, and enormously rapid strides are being made in technology for storing, organizing, and accessing the ever-growing tidal wave of information.” The Internet provides vast resources that are easily available, but also requires that users develop skills in information literacy (knowing when information is needed, being able to find, evaluate, and effectively use it for one’s immediate need) and technology literacy (using media to access and communicate information effectively) (NFIL, 2006). Developing the skills required to effectively utilize the resources afforded by the “Information Age” is an opportunity for teachers and students to use educational technology to develop critical thinking skills (King, 2002), which are applicable in a

variety of arenas necessary to transformative learning (Mezirow & Associates, 2000) and essential to facilitating the development of a democratic society (Brookfield & Preskill, 2005).

Both Eduard Lindeman (1926) and Malcolm Knowles (1980) discuss the need for adult education to be rooted in real experiences and to be focused on addressing the real-life needs of learners. According to Lindeman, “the best teaching method is one which emerges from situation-experiences” (1926, p. 115). King (2002) uses problem-based learning as an instructional method in her courses to teach educational technology to teachers. Based on her experiences, teachers who as learners engage in problem-based learning become more comfortable in using this approach in their own classes and become convinced of its value. This is also a path for teachers to shift from teacher-centered to student-centered learning (King, 2002).

As a result of the use of educational technology in classrooms, changes in preparation and research methods are profound (King, 2002). Teachers now have an improved ability to access the Internet and a higher comfort level in using its resources, both from technological and content-based standpoints. Examples of these changes are the use of multimedia or web pages, different or wider sources of information (government agencies, research sites, archives), and accessing information on teaching and learning.

Another change King (2002) noted in teachers was an increase in their level of confidence and empowerment. Anxiety and fear related to technology dissipated as teachers’ technical knowledge and skills grew. Teachers became empowered to adopt educational technology as a part of their classroom practice. This progression along King’s “journey of transformation” leads her learners to a place where they could use and act on their newly acquired perspectives (Mezirow’s step 10). “Confidence and empowerment bring the educators to the point where they are ready to serve as a bridge across the gap of educational expertise and technology know-how” (King, 2002, p. 49). According to King (2002), empowered teachers able to synthesize their expertise with new learning environments created by current and future technology is the best solution for transforming classroom practice. This aligns well with TLT, as the purpose of

transformative learning is to develop “a crucial sense of agency over ourselves and our lives” (Mezirow, 1981, p. 20).

There are three critical factors that need to be present in order for professional development centered around educational technology to be facilitative of perspective transformation: training and support (in emotional, technical, and instructional arenas), time to commit to learning and integrating new knowledge and skills into practice, and a collaborative approach to developing new curricula and utilizing newly acquired skills (King, 2002). The kinds of transformations that are likely to be detectable in teachers engaged in this type of professional development are changes in their perspectives towards teaching (role of the teacher, purpose of education, etc.) and the role of technology in the classroom (moving from viewing technology as a new way of supporting traditional teaching methods vs. technology as a new method of teaching) (King, 2002).

King’s findings are specific to a democratic context. Research needs to be conducted on whether or not these findings are applicable to a post-totalitarian context. Investigating the Center for the Evaluation of Education/Institute for Teacher Training (CEE/ITT) program’s instructional methodology for teaching educational technology to teachers and interviewing program participants about their experiences, that program’s potential for fostering transformative learning can be examined. Further, interviews with program participants and observations of teacher-to-teacher knowledge transfer and classroom practice revealed how changes in perspectives and roles are manifested in the context of schools in the Altai Republic.

Chapter Summary

The educational system in Russia has undergone significant changes since the dissolution of the Soviet Union in 1991. It is in the process of becoming a more student-centered and democratic institution charged with helping young Russian citizens discover their individuality and their self-defined place in society. The role of teachers in helping to prepare future generations of Russians capable of participating in a democratic and technologically oriented society (and world) is great. In order to help facilitate changes in the educational system and in society, teachers must themselves discover their

individuality and be capable of participating in a democratic and technologically oriented society.

Transformative learning is an ideal framework for exploring the changes that teachers in Russia are experiencing as they learn to integrate educational technology into the classroom. TLT provides a Western-based general model for understanding perspective transformation. An exploration of how transformative learning occurs in a post-totalitarian context will be a useful contribution to the literature base.

CHAPTER 3 - METHODOLOGY

The purpose of this project was to document the methods and approaches used by the Center for the Evaluation of Education/Institute for Teacher Training (CEE/ITT) program to teach school teachers about the use of educational technology and to examine the potential of these methods and approaches to facilitate perspective transformation.

This project addressed three research questions:

1. Are the methods used by the CEE/ITT program to train school teachers in the use of educational technology facilitative of transformational learning?
2. What, if any, perspective transformations occur in school teachers when they engage in professional development focused on educational technology and how are these changes manifested in classroom practice and educational philosophy?
3. What is the role of teacher-to-teacher knowledge transfer in facilitating any perspective transformations among teachers?

Setting

The setting for this project was the Altai Republic. The Altai Republic is an autonomous republic of the Russian Federation, located in southwestern Siberia just north of the nexus of China, Mongolia, and Kazakhstan. It is home to a population of approximately 200,000 ethnic Russians, indigenous Altaians, Kazakhs, and other ethnic identities. Schools in the Altai Republic are in the process of computerization, making professional development with respect to educational technology a necessary activity for teachers.

Methodology

I used case study methodology to conduct this research as the project met the qualifications outlined by Yin (1984) for the development of a research design utilizing this method. Case study methodology is an appropriate research design when “a ‘how’ or ‘why’ question is being asked about a contemporary set of events, over which the

investigator has little or no control” (Yin, 1984, p. 20). The research questions for this project sought to answer the larger question of how professional development with respect to educational technologies for teachers in the Altai Republic may be changing their attitudes and perspectives toward teaching and classroom practice. This is a recent phenomenon and an ongoing process. As an outsider in this context, I had no control over any aspect of the processes that teachers are engaged in or in my access to the research setting and participants.

There is very little published research on adult education either in the Altai Republic or in Russia as a whole (Morgan & Kljutcharev, 2001), making qualitative methods an appropriate choice for beginning to document both the research setting and the activities upon which this project focused (Yin, 1984). As this information is contextually bound it is best observed through qualitative methods. The data collected throughout this project is contextually bound, meaning that it exists in a specific time and place in the history of the specific communities and participants from which it was elicited. The Altai Republic is a remote and rather small region in the vast territory that comprises the Russian Federation. It is a distinctive blending of cultures and ethnicities, with a unique history and role in Russia. The phenomena observed by this project must be understood in light of the local context of rural schools and communities in the Altai Republic and the reasons they have for integrating educational technology into school curricula.

As the research setting was a revelatory case, meaning that the researcher had “an opportunity to observe and analyze a phenomenon previously inaccessible to scientific investigation” (Yin, 1984, p 43), an embedded, single-case design was developed for this project. The project sought to characterize and analyze multiple units, including federal/republic level training programs, local school training, administrators, and teachers. Multiple sources of evidence were used, which included interviews with teachers, teachers of teachers, program and school administrators, and observation.

Data Collection Procedures

Phase One

In fall 2006, I traveled to the Altai Republic to initiate phase one of data collection. I interviewed the staff from the Center for the Evaluation of Education (CEE) and the Institute for Teacher Training (ITT) about their programs to train school teachers in the use of computers and the incorporation of educational technology in classroom activities and curriculum development. I learned about the methodological approaches used to teach educational technology to adults and explored the extent to which these approaches are or are not facilitative of transformative learning. Following this, I interviewed seven informatics teachers at six different schools within the Republic who had experience with the CEE/ITT programs. I also interviewed an informatics teacher at Gorno-Altai State University. Staff of the CEE provided me with contact information for past participants in three of their courses. These included 1) a list of four informatics teachers certified as tutors in 2004 to teach the Intel Teaching for the Future program, 2) a list of six informatics teachers who attended a one week Intel Teaching for the Future course at the ITT in Gorno-Altai in summer 2006, and 3) a list of nine teachers from non-informatics subjects who attended a one week Intel Teaching for the Future course in Chermal in summer 2006.

I focused on obtaining interviews with participants who were trained as tutors as these were sites where the efforts to involve teachers in learning about educational technology could have been ongoing for the longest period of time. Due to language constrictions, the director of International Programs at GASU made initial contact and meeting arrangements with three of the 2004 tutors and two of the informatics teachers from the 2006 course. The latter participants were chosen because they were individuals with connections to GASU. The GASU informatics teacher was also selected due to his connection with the local university. I also interviewed two informatics teachers at a school in the Ongudaiskii Region, one of whom was personally known to me prior to the research project, the second referred to me by the first informatics teacher. As this teacher spoke English, I organized these meetings on my own.

The interviewees were drawn from four of the ten regions within the Altai Republic: Ongudaiskii, Shebalinskii, Chemalskii, and Maiminskii (which includes schools within the capital city of Gorno-Altai). These are mainly rural areas with small populations. The purpose during these visits was to explore the impact of the CEE/ITT programs on the teachers who have participated in them. As part of this program, informatics teachers trained by CEE/ITT are program tutors responsible for sharing their new knowledge with other teachers in their schools. I explored the methods by which this has been accomplished as well as the impacts of these learning communities on the teachers and how their curriculum and classroom activities have been changed or modified as a result.

I conducted these activities from September to November 2006. Following this, data was transcribed and a preliminary analysis conducted.

Phase Two

I returned to the Altai Republic in spring 2007 to initiate phase two of data collection. Utilizing contacts I had made in the previous field work session (fall 2006), requests for interviews with non-informatics teachers were made at schools in the regions of Shebalinskii, Chemalskii, Maiminskii, and Ongudaiskii. The director of International Programs at Gorno-Altai State University assisted in facilitating contact with past contacts when language barriers prevented me from contacting people directly.

During this phase, I conducted in-depth interviews with participants to solicit information related to the extent to which and how their experiences in the CEE/ITT program may have been facilitative of the process of perspective transformation. These participants represented a range of transformational readiness, gender, locations/regions, level of computer use and ages. All participants signed an informed consent form prior to the interview. This form was provided in Russian and explained in Russian, with the exception of two interviews which were conducted entirely in English.

Participant Selection and Interview Details

Table 3-1 contains a list of all interviewees by region and site. Following the table is a detailed description of how the interviewees were identified and contacted, on a region by region basis.

Table 3-1. Participant Detail by Region.

Region	Site	Participant	Fall '06/Spring '07
Maiminskii	School A, Gorno-Altaiisk	Informatics Teacher	Fall '06
	School B, Gorno-Altaiisk	Informatics Teacher	Fall '06
	Institute for Teacher Training, Gorno-Altaiisk	Methodologist	Fall '06
	Gorno-Altaiisk State University	Informatics Teacher	Fall '06
	Center for Educational Evaluation	Assistant Director	Summer '05
	Rural School	Informatics Teacher	Spring '07
		Russian Language and Literature Teacher/Vice Principal	Spring '07
	Preparatory School	English Teacher	Spring '07
	Suburban School	Informatics Teacher	Fall '06
Chemalskii	Rural School	Informatics Teacher	Fall '06
		Elementary School Teacher	Spring '07
		English Language Teacher/Vice Principal	Spring '07
		Russian Language and Literature Teacher	Spring '07

Region	Site	Participant	Fall '06/Spring '07
		Principal/Chemistry Teacher	Spring '07
Shebalinskii	Rural School	Informatics Teacher	Fall '06
		Geography Teacher	Spring '07
		Principal/ History Teacher	Spring '07
		Vice Principal/Chemistry Teacher	Spring '07
		Elementary School Teacher	Spring '07
		German Language Teacher	Spring '07
		English Language Teacher	Spring '07
	Environmental Education Center	Ecology Teacher	Spring '07
		Ecology Teacher	Spring '07
Ongudaiskii	Rural School	Informatics Teacher	Fall '06/Spring '07
		Informatics Teacher	Fall '06
	Rural School	Informatics Teacher	Spring '07
		Health Educator	Spring '07
	Children's Creative Center	Informatics	Spring '07

Shebalinskii Region.

Three field visits were made to this region. Contacts were made through the informatics teacher interviewed previously, who arranged for a meeting and interviews with the principal and vice principal at a local school. Subsequent interviews were arranged through the principal and teachers directly. Teachers with experiences with computers were advised by the principal of my interest in interviewing them and made

themselves available to meet with me during subsequent visits. During Spring 2007, I obtained six interviews with teachers at a local school and two from the Ecological Environmental Center, for a total of nine interviews in the Shebalanskii Region during both field sessions (see table 3-1 for details). At the local school, I gave presentations to classes of geography and English language.

Chemalskii Region.

Two field visits were made to this region. Contacts were made through the informatics teacher, who was interviewed during fall 2006 field work. This individual made all arrangements with teachers interested in being interviewed. During spring 2007, I obtained four interviews at a local school, for a total of five interviews in the Chemalskii Region during both field sessions. (see table 3-1 for details).

Maimainskii Region.

I was invited to a rural school in this region by a colleague at GASU who was teaching chemistry and English at the school during my field work session. I was invited to give a presentation on past collaborative work between Kansas universities and GASU. I took this opportunity to meet with the informatics teacher at this school and request his participation in an interview and his assistance in locating other teachers who would agree to an interview. I returned to this school once to interview two teachers.

Through my interpreter during the spring 2007 field session, I met and interviewed a teacher from the Republican Lyceum. This is a school at the Republic level (as opposed to city or regional levels, to which all other schools in this study belong) and located in Gorno-Altai.

I obtained three interviews from this region in Spring 2007, for a total of nine interviews in the Maimainskii Regions during both field sessions (see table 3-1 for details).

Ongudaiskii Region.

I worked through a personal contact to arrange interviews with teachers in the Ongudaiskii region. In fall 2006, I interviewed an informatics teacher at a school, who agreed to locate additional interview participants during spring 2007. I made one visit to

this region during this field session, where I interviewed three teachers from two additional schools in the region. Participants were selected by the informatics teacher interviewed in fall 2006 and the regional educational administrator. During both field sessions, I interviewed a total of five teachers from Ongudaiskii Region (see table 3-1 for details).

I used semi-structured interviews as the primary method of gathering data. Interviews were conducted with the assistance of a trained interpreter. All interviews were recorded. I transcribed all interviews and two additional interpreters/translators reviewed the interpretations and transcriptions to check for accuracy and to capture additional details.

In addition to interviewing, I used participant observation when possible to gain a better understanding of how CEE/ITT implements its programs and how teachers are transmitting new knowledge to their colleagues. On two occasions I was able to observe parts of CEE/ITT training sessions where teachers were working on their own projects, engaging in instructional lectures, and presenting the results of their work. I also was able to observe a tutor teaching a lesson to colleagues in the Chemalskii Region.

I also supplemented my understanding of this phenomenon by examining the materials used by CEE/ITT for training and by teachers for instruction, when possible and appropriate. I was given a copy of the Intel Teaching for the Future textbook and a listing of ITT course descriptions.

All of these activities (with the exception of the observations made at the CEE/ITT trainings) were conducted with the assistance of interpreters/translators. Prior to beginning the interviews, I worked with my interpreters to acquaint them with the purposes of the research, the questions that were asked, and familiarized them with the informed consent form. I worked with five different interpreters during the course of the entire project. All were instructors from the English language department at Gorno-Altai State University (GASU). They were formally trained interpreters with specializations in English and all were native Russian speakers.

Instrumentation

Mezirow's (1991) transformative learning theory and King's (2002) journey of transformation provided the frameworks for the interview protocols. Asking questions framed by previous research on perspective transformation provided data about how teachers' experiences align with current theories about the process of perspective transformation. Because of the recursive and non-linear process of perspective transformation, several questions are related to more than one step in the processes delineated by Mezirow (1991) and King (2002). For example, questions revealing that a participant engaged in questioning previously held assumptions (Mezirow step 3, King step 2) also helped establish that perspective transformation has occurred (Mezirow step 10, King step 4). Interview questions were generated with the purpose of learning about the specific experiences of teachers in the contexts of their professional development activities and impacts on teaching practices and educational philosophies.

Prior to beginning the second phase of field work, the instruments were revised based on field experiences and data gathered in the first phase and discerning a clearer link between teachers' experiences and the theoretical underpinnings of the research framework. Changes were made to the protocol with two issues in mind:

1. Reducing the number of questions (30 in the original, reduced to 26 in the final version). Interviews were generally limited to one hour due to teacher schedules and availability. Language constraints (needing to allow time for translation) also contributed to this decision.
2. The need to focus on specific elements reflected in the literature on TLT. The original version of the instrument included questions relating to social aspects. Given that this project focused on changes in perspectives of teachers toward teaching, interview questions focused on changes in the epistemic arena. While these areas (epistemic and social) are related, questions regarding social concerns were deleted from the instrument and priority focus given to epistemic aspects. I also felt a need, based on subsequent reading and re-reading of the theoretical frameworks, to place the experiences of teachers in a larger context, and to focus on not just

their experiences with learning computers, but their experiences and changes in their teaching throughout their careers.

The instrument was also modified to be more general. The original interview protocol referenced the CEE/ITT program heavily, which is a construct more removed from the experience of the teachers I interviewed in phase two. These teachers are now learning computers more within the context of their own schools, rather than directly participating in the CEE/ITT program. I also combined some questions (like collapsing separate questions about curriculum and methods into one). Based on fall 2006 fieldwork, I didn't anticipate finding many teachers who have progressed to the point of modifying curriculum to incorporate educational technology. It is included as part of one question about changes in classroom activities, so any impacts to curriculum had a pathway for surfacing in the interview.

A few questions were also added to capture information on attitudes about sources of knowledge and authority/personal responsibility, which could be indicators of perspective transformation.

The questions below were asked of school teachers. Follow up questions were asked as appropriate for clarification and to more deeply explore the issues raised by the answers to the questions below.

Table 3-2. Questions for School Teachers.

Journey of Transformation (King)	Perspective Transformation (Mezirow)
<i>Fear and uncertainty</i>	<ol style="list-style-type: none"> 1. <i>A disorienting dilemma</i> 2. <i>Self-examination with feelings of shame or guilt</i>
<p>Where were you born, raised?</p> <p>How did you feel when going through the process of learning computers? What were your reactions? Was it exciting, did you have doubts, fears?</p> <p>How is education/school different today than when you were a student or how has it changed throughout your teaching career?</p>	
<i>Testing and exploring</i>	<ol style="list-style-type: none"> 3. <i>A critical assessment of epistemological, sociocultural, or psychological assumptions</i> 4. <i>Recognition that one's discontent and the process of</i>

Journey of Transformation (King)	Perspective Transformation (Mezirow)
	<p><i>transformation are shared and that others have negotiated a similar change</i></p> <p><i>5. Exploration of options for new roles, relationships, and actions;</i></p>
<p>How long have you been a teacher? Why did you become a teacher? Where did you study?</p> <p>Why did you become involved in learning computers? How long have you been working at it?</p> <p>Describe your process of learning computers. Did you participate in training? Do you participate in a learning group?</p> <p>How have other teachers helped you learn to use computers? Example?</p> <p>What do you have in common with other teachers here who are learning computers? How did you come to realize this commonality?</p> <p>Have you ever needed help in preparing for using computers in your teaching?</p> <p>Currently, what do you think the purpose of education is? What is the role of the teacher? How has this changed during your career? Can you attribute any of these changes to your computer learning?</p> <p>Have your experiences with computers affected your attitude toward teaching? How have your attitudes about teaching changed throughout your career?</p> <p>How will technology change the educational system in the Altai Republic? How might classroom practice be different? How might the goals of education change?</p> <p>What are the skills and concepts that your students need to learn in school? How have your beliefs about this changed during your teaching career?</p> <p>What are the roles of teachers in your community? What are the responsibilities? How have your beliefs about this changed during your teaching career?</p> <p>Have you ever experienced a conflict in your beliefs or knowledge about education or teaching? How did you resolve this conflict?</p> <p>Where do you think knowledge comes from? Who creates knowledge?</p>	
<i>Affirming and</i>	<i>6. Planning a course of action</i>

Journey of Transformation (King)	Perspective Transformation (Mezirow)
<i>connecting</i>	<p>7. <i>Acquisition of knowledge and skills for implementing one's plans</i></p> <p>8. <i>Provisional trying of new roles</i></p> <p>9. <i>Building of competence and self-confidence in new roles and relationships</i></p>
<p>How could the process of learning computers be improved?</p> <p>How have your experiences with computers changed what you do in the classroom? With regards to instructional methods? Curriculum? Testing?</p> <p>Have computers affected relationships between teachers? Between students? Between teachers and students? What are the relationships like before?</p> <p>How does the school's administration support your acquisition of computer skills and the use of computers in teaching? How did you make time to learn these skills?</p> <p>Is there anything else that could help you become a more effective teacher?</p> <p>What are the roles of teachers in your community? What are the responsibilities? How have your beliefs about this changed during your teaching career?</p>	
<i>New perspective</i>	<p>10. <i>A reintegration into ones life on the basis of conditions dictated by one's new perspective</i></p>
<p>What are your teaching goals? How does educational technology help you reach these goals?</p> <p>What does educational technology bring to the classroom?</p> <p>What benefits have you seen from this project to the school? Community? Students? Other teachers? Yourself?</p> <p>What plans do you have for further learning involving computers and computer resources? Currently, what do you think the purpose of education is? What is the role of the teacher? How has this changed during your career? Can you attribute any of these changes to your computer learning?</p> <p>How will technology change the educational system in the Altai Republic? How might classroom practice be different? How might the goals of education change?</p> <p>What are the skills and concepts that your students need to learn in school? How have</p>	

Journey of Transformation (King)	Perspective Transformation (Mezirow)
<p>your beliefs about this changed during your teaching career?</p> <p>What do you think are some of the current problems in the educational system? Who is responsible for solving them? What is your role in solving them?</p> <p>Have your experiences with computers affected your attitude toward teaching? How have your attitudes about teaching changed throughout your career?</p> <p>What are the roles of teachers in your community? What are the responsibilities? How have your beliefs about this changed during your teaching career?</p> <p>What are your teaching goals? How can computers help you reach these goals?</p>	

Questions for CEE/ITT program staff and informatics teachers were developed using King’s (2000) three critical factors for perspective transformation. Questions were designed to help determine whether the methods used by the CEE/ITT program for professional development for integrating educational technology into classrooms in the Altai Republic were also facilitative of perspective transformation. Several questions were also designed for the purpose of learning more about the educational system in the Altai Republic and to determine the educational philosophies of the CEE/ITT program. Follow up questions were asked as appropriate for clarification and to more deeply explore the issues raised by the answers to the questions below.

Table 3-3. Questions for CEE/ITT Staff and Informatics Teachers.

Journey of Transformation (King)	Perspective Transformation (Mezirow)
<i>Fear and uncertainty</i>	<ol style="list-style-type: none"> 1. <i>A disorienting dilemma</i> 2. <i>Self-examination with feelings of shame or guilt</i>
<p>Where were you born, raised?</p> <p>What other places have you traveled to?</p> <p>What previous experience did you have with computers before participating in the CEE/ITT program?</p> <p>How did you become interested in information technologies? Why did you become involved?</p>	

Journey of Transformation (King)	Perspective Transformation (Mezirow)
How is education/school different today than when you were a student or how has it changed throughout your teaching career?	
<i>Testing and exploring</i>	<p><i>3. A critical assessment of epistemological, sociocultural, or psychological assumptions</i></p> <p><i>4. Recognition that one's discontent and the process of transformation are shared and that others have negotiated a similar change</i></p> <p><i>5. Exploration of options for new roles, relationships, and actions;</i></p>
<p>How long have you been a teacher? Why did you become a teacher? Where did you study?</p> <p>Describe your involvement in the CEE/ITT program. Did you participate in off-site training? Have you completed certification? Do you participate in an on-site learning group?</p> <p>Describe how you have taught teachers to use computers. How many teachers have you taught? How is it different from teaching students? What do you do differently?</p> <p>What can you tell me about teachers' process of learning? How do they progress? What problems do they have? What changes have you noticed in them? How is teaching teachers different from teaching students?</p> <p>Currently, what do you think the purpose of education is? What is the role of the teacher? How has this changed during your career?</p> <p>How have your attitudes about teaching changed throughout your career?</p> <p>How will technology change the educational system in the Altai Republic? How might classroom practice be different? How might the goals of education change?</p> <p>What are the skills and concepts that your students need to learn in school? How have your beliefs about this changed during your teaching career?</p> <p>What are the roles of teachers in your community? What are the responsibilities? How have your beliefs about this changed during your teaching career?</p> <p>Have you ever experienced a conflict in your beliefs or knowledge about education or</p>	

Journey of Transformation (King)	Perspective Transformation (Mezirow)
<p>teaching? How did you resolve this conflict?</p> <p>Where do you think knowledge comes from? Who creates knowledge?</p>	
<p><i>Affirming and connecting</i></p>	<p><i>6. Planning a course of action</i></p> <p><i>7. Acquisition of knowledge and skills for implementing one's plans</i></p> <p><i>8. Provisional trying of new roles</i></p> <p><i>9. Building of competence and self-confidence in new roles and relationships</i></p>
<p>How could the CEE/ITT program be improved?</p> <p>Have computers affected relationships between teachers? Between students? Between teachers and students? What are the relationships like before?</p> <p>How does the school's administration support your acquisition of computer skills and the use of computers in teaching? How do teachers make time to learn these skills?</p> <p>What are the roles of teachers in your community? What are the responsibilities? How have your beliefs about this changed during your teaching career?</p>	
<p><i>New perspective</i></p>	<p><i>10. A reintegration into ones life on the basis of conditions dictated by one's new perspective</i></p>
<p>What are your teaching goals? How does educational technology help you reach these goals?</p> <p>What does educational technology bring to the classroom?</p> <p>What benefits have you seen from this project to the school? Community? Students? Other teachers? Yourself?</p> <p>What plans do you have for further learning involving computers and computer resources? Currently, what do you think the purpose of education is? What is the role of the teacher? How has this changed during your career?</p> <p>How will technology change the educational system in the Altai Republic? How might classroom practice be different? How might the goals of education change?</p> <p>What are the skills and concepts that your students need to learn in school? How have your beliefs about this changed during your teaching career?</p>	

Journey of Transformation (King)	Perspective Transformation (Mezirow)
<p>How have your attitudes about teaching changed throughout your career?</p> <p>What are the roles of teachers in your community? What are the responsibilities? How have your beliefs about this changed during your teaching career?</p>	

Table 3-4 below illustrates how the interview protocols provided the data required to address the research questions previously identified. Where appropriate data from CEE/ITT program staff was used to provide additional support and alternate perspectives on the experiences of teachers in professional development activities designed to integrate educational technology into high school curricula.

Table 3-4. Alignment of Interview Protocols with Research Questions.

Research Questions	Protocol 1 (Teachers)	Protocol 2 (CEE/ITT staff)	Source
<p>1) Are the methods used by the CEE/ITT program to train high school teachers in the use of educational technology facilitative of transformational learning?</p>	<p>When did you become involved in the CEE/ITT program?</p> <p>Why did you become involved?</p> <p>Why did you become involved in learning computers? How long have you been working at it?</p> <p>Describe your process of learning computers.</p> <p>Did you participate in training? Do you participate in a learning group?</p> <p>How could the process</p>	<p>Describe your program to teach educational technology to school teachers.</p> <p>How was the model for this program chosen? Was utilizing specialists in instructional technology considered or discussed?</p> <p>Describe the workshop agenda for training teachers in the use of educational technology in the classroom.</p> <p>How many hours did it last, what activities did they participate in? What topics were covered? How are computers used?</p>	<p>Lead teacher (informatics)</p> <p>Other teachers</p> <p>CEE/ITT program staff</p>

Research Questions	Protocol 1 (Teachers)	Protocol 2 (CEE/ITT staff)	Source
	<p>of learning computers be improved?</p> <p>How does the school's administration support your acquisition of computer skills and the use of computers in teaching? How did you make time to learn these skills?</p>	<p>How would you describe the learning environment/atmosphere in your training/programs?</p> <p>What benefits have you seen from this project to the schools? Community? Students?</p> <p>How could this program be improved?</p> <p>What future directions will your program take?</p> <p>How does the schools' administration support teachers' acquisition of computer skills and the use of computers in teaching?</p>	
<p>2) What, if any, perspective transformations occur in high school teachers when they engage in professional development focused on educational</p>	<p>Currently, what do you think the purpose of education is? What is the role of the teacher?</p> <p>How has this changed during your career?</p> <p>Can you attribute any of these changes to your computer learning?</p> <p>How is education/school</p>	<p>Why do your participants choose to learn about computers? What motivates them to engage in this type of learning, skill building?</p> <p>What changes/impacts have you seen in the teachers who participate in your programs?</p> <p>Confidence/comfort in using computers, approaches/attitudes toward the use of computers in class,</p>	<p>Lead teacher (informatics)</p> <p>Other teachers</p> <p>CEE/ITT staff</p>

Research Questions	Protocol 1 (Teachers)	Protocol 2 (CEE/ITT staff)	Source
<p>technology and how are these changes manifested in classroom practice and educational philosophy?</p>	<p>different today than when you were a student?</p> <p>How will technology change the educational system in the Altai Republic? How might classroom practice be different? How might the goals of education change?</p> <p>What are the skills and concepts that your students need to learn in school? How have your beliefs about this changed during your teaching career?</p> <p>What are the roles of teachers in your community? What are the responsibilities? How have your beliefs about this changed during your teaching career?</p>	<p>overall attitude?</p> <p>How is the education system in the Altai Republic organized/structured? Who decides what curricula to teach?</p> <p>What is the role of teachers in the Altai Republic?</p> <p>What is the purpose of education?</p> <p>What are the skills and concepts that students need to learn in school?</p> <p>How is education/school different today than when you were a student?</p> <p>How will technology change the educational system in the Altai Republic? How might classroom practice be different? How might the goals of education change?</p>	
<p>3) What is the role of teacher-to-teacher</p>	<p>Describe your process of learning computers. Did you participate in</p>	<p>Describe how the teacher learning groups function. What guidance do you give</p>	<p>Lead teacher Other teachers CEE/ITT staff</p>

Research Questions	Protocol 1 (Teachers)	Protocol 2 (CEE/ITT staff)	Source
knowledge transfer in facilitating any perspective transformations among teachers?	training? Do you participate in a learning group? How have other teachers helped you learn to use computers? Example? Have computers affected relationships between teachers? Between students? Between teachers and students? What are the relationships like before?	program participants in transferring knowledge to their peers? Why did you choose to utilize teacher-to teacher knowledge transfer as part of your program? What outcomes have you seen from this aspect of your program?	
Demographic information	Where were you born, raised? How long have you been a teacher? Why did you become a teacher? Where did you study?		Lead teacher Other teachers

Data Analysis

I coded and managed the data collected from these sources using QSR N6 software to create a case study database. During the data collection process, transcripts were coded using frameworks from Mezirow (1991) and King (2002). The use of Mezirow’s framework entailed coding for statements related to the 10 stages of perspective transformation. King’s critical factors for facilitating perspective

transformation among teachers framework was used to assess the CEE/ITT program's potential for facilitating perspective transformation. King's uses of educational technology by teachers framework was used to help determine where the study's teacher participants were in the process of transformation. Emergent themes were also included in the case study database.

Interview data was analyzed using a key word/phrase search derived from the aforementioned frameworks of Mezirow (1991) and King (2002). The case study database was utilized to conduct searches and to tabulate and manage search results. Table 3-5 below shows the relationship of Mezirow's stages of perspective transformation, key words/phrases, and protocol questions. Some questions are present in more than one stage as the concepts are related. Table 3-6 shows the relationship of King's framework to the key works/phrases used to search the database and the protocol questions. Data collected from participants was used to generalize phenomena occurring in the research setting to the theoretical frameworks used to design the study's protocols.

Table 3-5. Alignment of Mezirow's Theoretical Framework, Key Words/Concepts, and Protocol Questions

Mezirow's Perspective Transformation	Key words/concepts/phrases	Protocol questions
Stage 1 Disorienting dilemma	Need, necessity, expectation, fear	How did you feel when going through the process of learning computers? What were your reactions? Was it exciting, did you have doubts, fears? Why did you become involved in learning computers? How long have you been working at it??
Stage 2 Self-exploration	Questioning, exploration, shame, guilt, motivation for learning	How is education/school different today than when you were a student or how has it changed throughout your teaching career? How did you feel when going through the process of learning computers? What were your

Mezirow's Perspective Transformation	Key words/ concepts/phrases	Protocol questions
	computers	reactions?
Stage 3 Critical reflection of assumptions	Changing opinion, change, outlook	<p>Currently, what do you think the purpose of education is? What is the role of the teacher? How has this changed during your career? Have your experiences with computers affected your attitude toward teaching? How have your attitudes about teaching changed throughout your career?</p> <p>What are the roles of teachers in your community? What are the responsibilities? How have your beliefs about this changed during your teaching career?</p> <p>What do you think are some of the current problems in the educational system? Who is responsible for solving them? What is your role in solving them?</p>
Stage 4 Recognition of shared experiences	Experience, change	<p>What do you have in common with other teachers here who are learning computers? How did you come to realize this commonality?</p> <p>Have you ever need help in preparing for using computers in your teaching?</p>
Stage 5 Exploration of options	Buying computer, using new skills, actions taken after learning, training, roles, relationships	Describe your process of learning computers. Did you participate in training? Do you participate in a learning group?
Stage 6	Future plans and	What plans do you have for further learning

Mezirow's Perspective Transformation	Key words/ concepts/phrases	Protocol questions
Planning a course of action	goals, actions taken or to be taken	involving computers and computer resources? What are your teaching goals? How does educational technology help you reach these goals?
Stage 7 Acquisition of knowledge and skills	Training, self-education, assistance/help from others	Describe your process of learning computers. Did you participate in training? Do you participate in a learning group? How does the school's administration support your acquisition of computer skills and the use of computers in teaching? How did you make time to learn these skills?
Stage 8 Provisional trying of new roles	Changes in teaching methods, how teachers are using educational technology	How have your experiences with computers changed what you do in the classroom? With regards to instructional methods? Curriculum? Testing? Have computers affected relationships between teachers? Between students? Between teachers and students? What are the relationships like before?
Stage 9 Building of competence and self-confidence	Expressing confidence, discussing skill level	How have your experiences with computers changed what you do in the classroom? With regards to instructional methods? Curriculum? Testing? Have computers affected relationships between teachers? Between students? Between teachers and students? What are the relationships like before?
Stage 10	Worldview or	Have your experiences with computers affected

Mezirow's Perspective Transformation	Key words/concepts/phrases	Protocol questions
Reintegration	perspective change	<p>your attitude toward teaching? How have your attitudes about teaching changed throughout your career?</p> <p>Where do you think knowledge comes from?</p> <p>Who creates knowledge?</p> <p>What do you think are some of the current problems in the educational system? Who is responsible for solving them? What is your role in solving them?</p>

Table 3-6. Alignment of King's Theoretical Frameworks, Key Words/Concepts, and Protocol Questions.

King's Framework	Key Words/Phrases/Concepts	Protocol Questions
Critical Factors for Facilitating Transformation		
Training and Support	Participated in training courses, provided or received assistance, administrative support, approaches to teaching teachers	<p>Describe your process of learning computers. Did you participate in training? Do you participate in a learning group?</p> <p>What methods are used to teach computer skills to other teachers?</p> <p>How does the school's administration support your learning of computer skills and the use of computers in teaching?</p>
Time to commit to integrating new skills and	Time, access to computers, limitations, activities, use of computers	How did you make time to learn these skills?

King's Framework	Key Words/Phrases/Concepts	Protocol Questions
knowledge into practice		
Collaborative approach to developing new curricula and using new skills	Provided or received assistance, examples of collaboration, activities, relationships and activities with colleagues	Do you participate in a learning group? How have your experiences with computers changed what you do in the classroom? With regards to instructional methods? Curriculum? Testing? Have computers affected relationships between teachers?
Uses of Educational Technology	Support and supplement, activities, integration, changes in curricula	How have your experiences with computers changed what you do in the classroom? With regards to instructional methods? Curriculum? Testing?

Chapter Summary

The purpose of the project was to examine the potential for perspective transformation among teachers engaged in professional development with respect to educational technologies. The setting for the project was the Altai Republic, Russian Federation. An examination of this topic in this setting had not previously been conducted, leading to the selection of case study methodology for the project. The research design, protocols, and analysis were undertaken using the frameworks of Mezirow (1991) and King (2002). Both of these frameworks outline criteria and stages for perspective transformation among adults.

The study utilized multiple sources of evidence (interviews with program and school administrators, school teachers, observation) and multiple units of analysis (federal/republic levels of training and support, school level training and support,

informal experiences, teachers, administrators). A case study database was developed to manage the data and to provide a chain of evidence and pathway for replicability. The data was analyzed using a key word/phrase/concept search and tabulation and was generalized to theories about perspective transformation.

CHAPTER 4 - ANALYSIS

This chapter provides an analysis of the data collected during this study. The analysis is grouped into four main categories: teachers' use of educational technology, critical factors for facilitating perspective transformation, Mezirow's perspective transformation, and emergent themes. Sources of data include semi-structured interviews with school teachers, school administrators, and Center for the Evaluation of Education/Institute for Teacher Training (CEE/ITT) program staff, as well as observations of professional development trainings.

Description of Research Participants

There were 28 participants in this study: 25 teachers (10 informatics teachers, 15 teachers of other subjects), two staff members from the CEE/ITT program, and one university informatics instructor. Among the 25 teachers, two also served as principals and three as vice principals. Other subjects represented were Russian language and literature (2 teachers), English language (3 teachers), German language (1 teacher), elementary school (2 teachers), chemistry (2 teachers), geography (1 teacher), history (1 teacher), ecology (2 teachers), and health education (1 teacher). Of the total participants, 19 were women and nine were men. These teachers are representatives from nine schools, an environmental education center, and a children's creative center.

Table 4-1 provides details about the participants' length of time in their profession, length of computer use, and their level of training at the time this study was conducted. Master level indicates professional training in computer use. All informatics teachers were designated masters. Beginner and intermediate levels relate to the type of training that other participants have had. Beginners have had individual instruction or training in basic computer skills, most often provided in their school. Intermediate level indicates that participants have participated in CEE/ITT trainings. A dash (-) indicated the information is unknown to the researcher. Participants' names have been changed to protect their identities.

Table 4-1. Details about Participants Level of Computer Training and Professional Service

Participant	Subject	Years in Profession	Years of Computer Use	Level of Computer Training
Maria Petrovna	Informatics Teacher	27	15	Master
Boris Vladimirovich	Informatics Teacher	22	22	Master
Lubova Nikolaevna	Methodologist	-	-	Master
Nikolai Petrovich	Informatics Teacher	-	18	Master
David Nikolaevich	Assistant Director	-	-	Master
Vladimir Romanovich	Informatics Teacher	2	-	Master
Victoria Pavlovna	Russian Language and Literature Teacher/Vice Principal	15	3	Beginner
Marina Vladimirovna	English Teacher	9	2	Beginner
Yuri Borisovich	Informatics Teacher	3	10	Master
Yuri Ivanovich	Informatics Teacher	-	-	Master
Tatiana Davidovna	Elementary School Teacher	30	1	Intermediate
Yulia Ivanovna	English Language Teacher/Vice Principal	6	3	Intermediate
Galina Sergeevna	Russian Language and Literature Teacher	27	6	Intermediate
Olga Alexandrovna	Principal/Chemistry Teacher	26	6	Intermediate
Alexander Yurevich	Informatics Teacher	-	-	Master
Maria Alexandrovna	Geography Teacher	16	3	Beginner
Olga Borisovna	Principal/ History Teacher	39	-	Beginner
Vera Ivanovna	Vice Principal/	-	-	Beginner

Participant	Subject	Years in Profession	Years of Computer Use	Level of Computer Training
	Chemistry Teacher			
Maria Victorovna	Elementary School Teacher	15	2	Beginner
Nadezhda Petrovna	German Language Teacher	28	2	Beginner
Galina Nikolaevna	English Language Teacher	33	1	Beginner
Elena Mikhailovna	Ecology Teacher	-	-	Beginner
Victoria Nikolaevna	Ecology Teacher	-	-	Beginner
Evgeny Alexandrovich	Informatics Teacher	33	22	Master
Peter Sergeevich	Informatics Teacher	11	15	Master
Peter Ivanovich	Informatics Teacher	2	-	Master
Olga Sergeevna	Health Educator	2	-	Intermediate
Oxana Maximovna	Informatics	3	-	Master

Teachers' Use of Educational Technology

King (2002) describes a model of perspective transformation that characterizes teachers as moving through three stages of adoption as they learn how to use educational technology. Teachers new to educational technology typically begin using it to support and supplement their current curricula or everyday tasks. Examples of this are using software to generate a computer created overhead or using e-mail for communication. In the next stage, educational technology is integrated into the curriculum. An example of this is requiring its use by students in completing assignments, such as finding information on the Internet. The final stage is transformation, where course curricula are totally redesigned and reassessed in light of newly developed perspectives on teaching and learning. This is evidenced by “a fundamental reframing of how the teachers approach instructional preparation and delivery” (King, 2002, p. 43). Teachers may

create research projects that have no predetermined answer, which require students to draw on a variety of sources to synthesize a completely new solution to a problem.

For the purpose of analyzing the information collected from teachers in the Altai Republic on their uses of educational technology, the stages outlined by King were followed for coding using these parameters: 1) in the area of support/supplement, coding included participants' descriptions of using educational technology in finding additional material for their courses or in the preparation of traditional material, such as assignments or paper tests; 2) in the area of integration, coding included incidents of teachers using technology in a teaching situation, such as giving a presentation, computer-based testing and student use of technology in assignments; 3) in the area of transformation, coding included incidents where change in classroom curricula or activities was indicated.

Twenty-one participants made statements related to teachers' uses of educational technology in the classroom and in teaching practice. Of these, six participants were informatics teachers (29%) and fifteen (71%) were teachers of other subjects—ecology, geography, English language, chemistry, history, German language, Russian language and literature, health education, and elementary school. Data in this section has been limited to teachers working in schools.

As shown in Figure 4-1, eighty-six percent reported using educational technology to support and supplement their existing curriculums, while 81 percent have begun to integrate it into classroom practice. There was only one example of a participant discussing curriculum that had been transformed by the use of educational technology, which represents .05 percent of the participants providing data on this topic area.

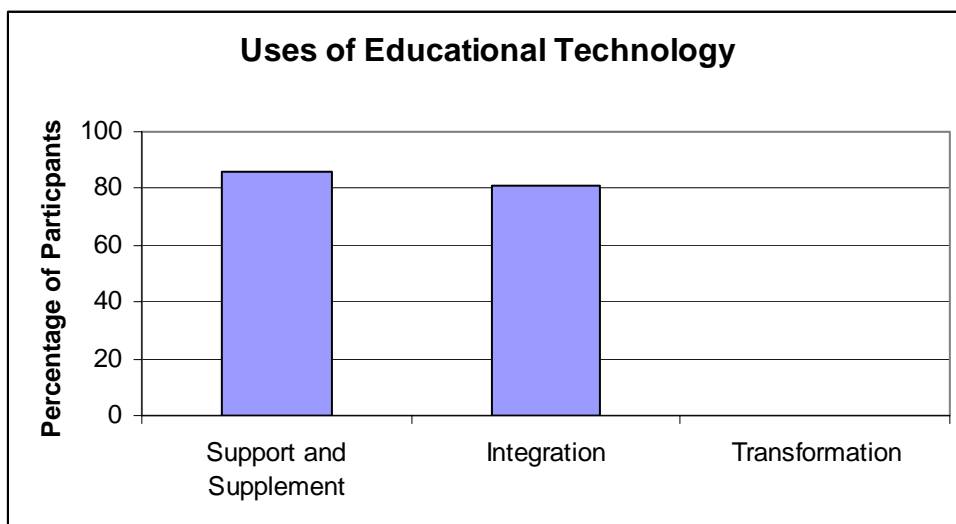


Figure 4-1. Participants' uses of educational technology.

Support and Supplement

Table 4-2 shows examples of how participants are using educational technology in the area of support/supplement. The types of uses most frequently indicated by the participants are obtaining subject information (57%) and material preparation (29%).

Table 4-2. Participants' Usage of Educational Technology in the Area of Support/Supplement

Uses of Educational Technology	Support and Supplement		
	subject information	methodology information	material preparation
Examples of uses	subject information	methodology information	material preparation
Number of participants	12	2	6
Percentage of participants	57%	10%	29%

In the area of support and supplement, participants identified two main uses of educational technology. These were 1) obtaining information (subject material and teaching methodology) from the Internet or other sources, generally CDs provided by the

Ministry of Education; and 2) the creation of materials for the classroom, such as visual aids, assignments, tests and other documents.

Galina Sergeevna, a Russian language and literature teacher, detailed the ways in which she had used educational technology (mainly a computer) to prepare course material.

First of all, I prepared some visual aids and material and cards for individual work, some diagrams or special cards. These cards have some text and gaps, like filling in the blank, but not with just words but some notions or ideas. They can be of different kinds. So this is the first thing that I used computers for most often.

Or sometimes I print the words for students to remember. (Transcript 21, personal communication, May 14, 2007)

Galina Nikolaevna, one of the English language teachers in the study, reported receiving a disk of lessons at a seminar she attended on new methods of foreign language instruction. Although the disk was designed for interactive use during a lesson, this teacher (like most of the teachers in this study) has limited access to computers for classroom use. Instead she uses the disk as a source of supplementary material. None of her textbooks have information on Indigenous People in the United States, so she uses the material and information on Alaskan Natives from a lesson on the disk to supplement the information she shares with students during class time (Transcript 14, personal communication, April 25, 2007).

Integration

Table 4-3 shows examples of how participants are using educational technology in the area of integration. The types of uses most frequently indicated by the participants are making presentations (52%), student work (48%) and testing (33%).

Table 4-3. Participants' Usage of Educational Technology in the Area of Integration

Uses of Educational Technology	Integration				
Examples of uses	testing	demonstrations, modeling, experiments	student work (assignments, presentations)	presentations	multimedia enhancement (video, visual, audio)
Number of participants	7	3	10	11	4
Percentage of participants	33%	14%	48%	52%	19%

Often supplementary material is used to support the teachers in their integration of educational technology in the classroom. Ninety-four percent of participants who discussed the use of technology to support and supplement teaching also discussed the use of computers in giving presentations to students, often with newly found material. Aside from making presentations using educational technology, these teachers are also integrating technology by using computer-based tests, showing video or other multimedia to their students, giving demonstrations or conducting experiments. In terms of student work, the teachers are asking students to complete assignments using information from the Internet or other digital materials and make their own presentations and reports.

Elena Mikhailovna, an ecology teacher, provided an example of how student activities have changed with the integration of educational technology.

We've got an activity called 'Springs'. We study (natural freshwater) springs and the ecological state of those that are located here (in our region). Some time ago they (students) only wrote papers for each of these springs and now each student has to make a presentation. Individual presentations for each of the springs and everything, all the materials, pictures concerning the spring were there on the computer. (Transcript 20, personal communication, April 25, 2007)

Elena Mikhailovna also shared an example of how the multimedia capabilities of computers are used to enhance her lessons. Throughout the interview this teacher repeatedly stated her preference for using nature itself and outdoor activities as the basis for her teaching. She granted that wintertime posed a difficulty in utilizing this preference and discussed how educational technology helped her to make activities more engaging for her students during this season. Educational technology also helped her to broaden the types of wildlife to which she can expose her students.

Some of the material can be given in a very interesting way with the help of the computer....For example, when we study birds which can not be found in this area, we can bring a disk and hear them sing. (Transcript 20, personal communication, April 25, 2007)

In addition to student work and multimedia enhancement, some participants (mainly science teachers) use educational technology to conduct experiments or show complex modeling, both of which are difficult given the limitations of the educational settings included in this study. This type of application can be utilized by both teachers and students. Evgeny Alexandrovich, an informatics and former physics teacher, discussed how the use of computers helped him to teach physics more effectively.

I was teaching physics for seventh graders with computers. Without the computer, pupils during one lesson can solve only one or two problems. With computers they can work at a different speed and can solve four, five, six problems during one lesson. Increased productivity working with computers is without doubt. I can prepare the lessons with the computer. For example, it is possible to do a couple of physics assignments and you would need different formulas, constants. It is really difficult to do all of this on paper during a class period. When a teacher prepares the tasks using computers, like with waves where a teacher models a program, it would be like working in a virtual lab. (Transcript 5, personal communication, October 22, 2006)

Transformation

There are limited examples of the use of technology to transform school curricula. Yuri Borisovich, an informatics teacher, reported an example of how informatics

curriculum had changed since he was a school student. Other informatics teachers reported similar experiences during their educations, but this was the only teacher who discussed the work students are currently engaged in during informatics courses.

When I was in high school, the computers were very old. We did some basic things in the field of programming, but our teacher was working somewhere else. It was like he told fairy tales about what computers could do. Now both teachers and high schools students can work with computers....Twice a year the educational authorities of the district and the republic organize conferences on the implementation of computer technologies into educational work and we make presentations on what has been done at schools. We also create games and animated cartoons. The first conference is at the district level and a very good chance for students to do more and learn more as they can grow. It's not just playing some games, but creating them. (Transcript 7, personal communication, October 19, 2006)

Many informatics teachers in this study didn't have access to computers until they were in university. One participant even reported studying computer programming without a computer, only by learning and writing algorithms on paper. Perhaps the newly available access to computers on the part of informatics teachers, coupled with software innovations, has made transformations in informatics curricula possible. As computer access spreads to other disciplines, perhaps similar curricula transformations will occur.

Summation of Teacher Usage of Educational Technology

The bulk of uses of educational technology are occurring in the first two areas identified by King, support/supplement and integration (2002). According to King's framework, this indicates that participants are engaged in activities which place them on the path toward perspective transformation, but have not completed the process. The use of educational technology by these participants is basically geared toward traditional methods of instruction—sharing information with students and making assessments about students' knowledge gain. The high level of use in student work may be evidence that students are being required to find information on their own and share it with others,

indicating a move from the traditional banking method of teaching (Freire, 1970) toward a student centered and more democratic learning environment.

Critical Factors for Facilitating Perspective Transformation

According to King (2002) there are three critical factors that need to be present in order for professional development centered around educational technology to be facilitative of perspective transformation: training and support (in emotional, technical, and instructional arenas), time to commit to learning and integrating new knowledge and skills into practice, and a collaborative approach to developing new curricula and utilizing newly acquired skills. Data collected from CEE/ITT staff, teachers, and observations were used for the analysis of professional development for teachers in the Altai Republic with respect to its potential for facilitating perspective transformation.

Training and Support

In the Altai Republic, training and support for teachers learning to use educational technology can be examined at two levels: 1) the federal/republic level and 2) the level of local schools. The initiative to computerize Russian schools is a federally-funded program. In 2000, the Putin administration created the President's Program for the Computerization of Schools to help fund the placement of computers in educational institutions throughout the country (Peterson, 2005). The program is administered through the Ministry of Education. In the Altai Republic, the Center for Educational Evaluation (CEE) and the Institute for Teacher Training (ITT), both elements of the Ministry of Education, are partners in the implementation and development of the Republic's programs for computerizing the schools. They provide schools with computers and training for teachers to use them. Schools also have responsibilities for providing training and support in teachers' use of educational technology, which mainly includes a variety of support mechanisms from the school's administration and instructional and technical support from informatics teachers.

CEE/ITT Training and Support

At the federal/republic level, CEE and ITT cooperate to provide information technology services to schools in the Altai Republic. These services include 1) supplying

schools with equipment, 2) providing technical support, 3) creating an information network, 4) establishing an information repository, and 5) training teachers in the use of the first four areas (Transcript 26, personal communication, August 2005). These organizations began providing these services in 2002 as a result of the implementation of the presidential program. The CEE/ITT initiative provides a variety of training courses in the areas of educational technology. There are training courses designed for informatics teachers and for teachers of other subjects. Courses offered in 2007 for informatics teachers included “Actual Problems in Teaching Informatics in General Education”, “Informatics Teaching Methods in Basic Schools” (for beginning teachers), “Local and Global Networks: Basic Site Building”, “The Organization and Maintenance of Computers”, and “Administering a School’s Local Network” (ITT, 2006). Courses for teachers of other subjects included “Using Information and Computer Technology in the Teaching Process”, “Methods for Teaching Informatics in Elementary School”, and “Internet Technology for Teacher Specialists” (ITT, 2006). Courses are free of charge and are offered both at the ITT in the capital city of Gorno-Altai and at different schools throughout the republic. In 2007, off-site trainings were held in the Tyrochaskii, Chemalskii, and Yst-Kanskii regions. Contact hours for ITT courses range from 48-152 hours (ITT, 2006). At the conclusion of the ITT training sessions, participants are provided with materials to help them implement what they learned after the workshop.

Lubova Nikolaevna is an informatics methodologist for ITT. She teaches courses on computer science basics and methods of teaching computer sciences at schools for teachers of various subjects, including informatics. According to Lubova Nikolaevna, her courses are designed to provide a balance of lecture and hands-on experience with using computer technologies, with about half of the time devoted to working with computers and half to lecture and other activities (Transcript 9, personal communication, September 12, 2006). Below, she provides details on the course content:

They (the courses) involve not only the problems of computers and computer sciences, but we also study different issues of educational sciences and we develop educational technologies. If we have time we visit open classes given by other teachers, if they don’t object. Within the three week courses we have more issues to study, including topics such as education in Russia in general and

specific educational technologies. While within the two week course, we have a more specified program mainly on computer sciences and related issues.

(Transcript 9, personal communication, September 12, 2006)

Lubova Nikolaevna also discussed the atmosphere of her trainings and the impacts on the participants.

The atmosphere is really friendly. Teachers come to study...technology with a great wish and normally I have a group of 11-12 people, as the number depends on the number of computers. And teachers really come to study. Previously there were people who did not know what a CPU looked like; they didn't know how to type. Now they are really glad to have a chance to study here and many promise to buy computers for themselves when they return back home. (Transcript 9, personal communication, September 12, 2006)

In discussing the fear that many adults have when beginning to use computers, Lubova Nikolaevna indicated that the ITT trainings provided the kind of emotional support that helped participants with these kinds of problems overcome them.

When we began our program, we came across such people. That's when people had no experience of work with computers, and actually they were afraid even to touch them just because not all of the schools had computer classrooms. And what we did here, we were able to break that psychological barrier. They were really afraid and you can laugh at it. But it was like a miracle to see that they started to work with computers. (Transcript 9, personal communication, September 12, 2006)

Observations of CEE/ITT training.

Two observations of CEE/ITT training sessions were conducted during the first phase of the field research. These observations were conducted without the assistance of an interpreter. The first observation was on the final day of a one week course for teachers of various subjects. The teachers were learning how to use the software programs PowerPoint and Publisher in project based learning. There were nine teachers working on computers and three instructors moving throughout the room giving individual help. Participants also asked one another for help. All participants were working very diligently and were highly focused and on-task. The work session was

followed by a lecture. The topic was “What is needed to prepare a presentation?” The presenter lectured for a few minutes then would interact with the audience, asking them questions. There were brief comments made by participants during this time.

The second observation was part of an Intel Teaching for the Future workshop. It was a three week version of the workshop for teachers of all disciplines. Participating teachers came from all over the republic. There were 30 people in attendance at the session where the observation took place. Teachers were making presentations of the projects they had been working on during the workshop. Teachers used PowerPoint, a laptop and projector to give their presentations. At the conclusion, the workshop instructors facilitated a debriefing session about the presentations. It was an active exchange between the discussion leader and participants.

Summation of Federal/Republic Level Training and Support.

There is clear evidence that the integration of educational technology into schools is being facilitated by the federal and republic levels in the area of support and training with respect to emotional, technical and instructional concerns. Programs have been developed and funds are being allocated to provide schools with equipment and technical support. Training and learning opportunities and materials are offered in several locations and are scheduled year round. Trainings are conducted in order to help participants overcome their psychological barriers to learning computers. Thus, the actions at the federal and republic level in terms of support and training appear to meet the requirements of King’s (2002) first critical factor for perspective transformation.

School Level Training and Support

The statements of 23 teachers were coded as related to King’s critical factor of training and support (2002). Teachers made statements related to training, assistance and their school’s administrative support of technology integration. Table 4-4 provides a numerical overview of their statements.

Table 4-4. Teacher Statements Related to Training and Support

	Participated in Training		Statements about Assistance		Statements about Administrative Support	
	CEE/ITT	School	Provides help	Receives help	Positive	Negative
Number of participants (23 total)	11	13	11	10	13	5
Percentage of participants	48%	57%	48%	43%	57%	22%
Total Numbers	18		16			
Total Percentages	78%		70%			

Training.

Seventy-eight percent of these 23 teachers had participated in either CEE/ITT training or training offered in their school, as indicated in Table 4-4. A higher percentage (57% vs. 48%) participated in training offered by schools, with 26 percent taking advantage of both kinds of training opportunities. Most training offered by the schools participating in this study was limited to basic computer skills, whereas the training offered by CEE/ITT is geared toward a higher level of user.

Of the nine schools represented in this study, six of them have offered courses in basic computer skills to their teachers. Two of them have offered intermediate level training. Basic courses are developed and organized by the informatics teachers. During the first phase of fieldwork, observational data was collected at one of the schools. At this particular school the informatics instructor, Yuri Ivanovich, blended a traditional method of teachers' professional development with his plans of teaching his colleagues the Intel Teaching for the Future course. Yuri Ivanovich constructed his intermediate level informatics training as a creative group, which is a concept used in Russian schools. A creative group is used for the purpose of allowing teachers in a school to teach other teachers in order to help with professional development. This is a method of sharing new

information and methods with colleagues. As part of their teaching and to improve their qualifications, Russian teachers have to develop projects or lessons. Every two to three years teachers present their work and results in what is called an open class, where administrators and other teachers in the school come to a teacher's class to observe his/her work. As teachers go through this process, they increase the level of their qualifications, which is tied to their salary. The teachers in Yuri Ivanovich's creative group were working on these kinds of projects and using computers and computer learning to help with this.

Yuri Ivanovich took an additional step to further ensure that his courses for teachers were connected to their teaching experiences. Hoping to see the results of his efforts in the near term, he planned for teachers to implement their new skills immediately.

This is why I planned that they would work parallelly studying here and at the same time they should enroll a microgroup of students to work on a given topic, a real one and they should have already started working on this topic. (Transcript 8, personal communication, October 18, 2007)

Galina Sergeevna is a Russian language and literature teacher at Yuri Ivanovich's school. She has participated in trainings at both the CEE/ITT and her school. She made the following comparison between the two.

Yes, they were different. Here we felt at ease. And at those courses it was a little bit psychologically difficult for us. Sometimes we didn't ask a question because we were ashamed to ask something if we didn't understand, as we were already grown up and it was shameful for us to admit that we didn't know something. And the level of teaching was a little bit higher in Gorno. (Transcript 21, personal communication, May 14, 2007)

Although there are examples of successful attempts to offer formal training to teachers in their own schools, there are also practical difficulties in delivering these courses. Peter Sergeievich, an informatics teacher, discusses his efforts to provide formal training to the teachers in his school.

Last year I tried to organize courses for teachers in how to use the computer because everyone understood the necessity of it. Here I talked to the director and

the administration about having courses in the school for teachers. We decided to teach the teachers, because they need to give some printed documents, so all teachers decided they needed to learn more. There were about 30 teachers who applied for the course, but only five who could really attend the course. The main difficulty was a scheduling conflict, as teachers teach at different times of day (Morning and afternoon shifts). Now they continue working by themselves. Next year, maybe in January, we will try to have these courses again. (Transcript 11, personal communication, October 22, 2006)

Assistance.

Table 4-4 shows that 70 percent of the 23 teachers with statements coded under the criteria of training and support had either provided or received help from others regarding the use of computers in their teaching. Teachers indicated that they were about as likely to give help as to receive it (48% vs. 43%). Informatics teachers were more likely to be identified as providers of assistance than teachers of other subjects and indicated getting help from resources beyond their school colleagues, usually informatics teachers at other schools or the university. Other providers of assistance to non-informatics teachers included family members, generally teachers' children.

Aside from the formal training offered in schools, informatics teachers are also an important source of informal training and technical support for their colleagues. Alexander Yurevich, an informatics teacher, gives an example of how his department provides technical support to teachers.

I help them a lot, the laboratory assistant helps. They have much help. But it is not always done by a lab assistant. Some of them have their own computers and prepare presentations at home, and then they come to me and ask to arrange the necessary equipment for the class and the laboratory assistant makes the projector and computer ready and then they do it themselves. (Transcript 2, personal communication, October 27, 2006)

Victoria Pavlovna is a Russian language and literature teacher and vice-principal. She has not participated in any formal training in educational technology, but has learned everything she knows informally from the informatics teachers in her school. "No courses but I just asked for help from Vladimir Romanovich and before him we had

another teacher of informatics. So I asked nearly everything” (Transcript 17, personal communication, May 4, 2007). Vladimir Romanovich, the informatics teacher at Victoria Pavlovna’s school, echoed her statements about how teachers in this school are learning educational technology.

In most cases it’s face to face education. Those who are interested, those who have questions, I consult them and help them. Victoria Pavlovna is the most interested of all the teachers. She has got a lot of questions and she asks me to help whenever she has some problems. And of course the other teachers as well, but a little less than she. (Transcript 18, personal communication, May 4, 2007)

Administrative support.

Administrative support at the school level can take many forms, ranging from directing resources toward the acquisition of educational technology, incentives for teachers who use educational technology, and encouraging teachers to participate in training opportunities. Table 4-4 shows that 57 percent of teachers (of the 23 with statements coded for the category of training and support) made positive statements about the support of their schools’ administration in the area of technology integration. Twenty-two percent made negative comments and .04 percent (1 teacher) made a neutral statement regarding administrative support. Those teachers who made negative comments about their school administration were all from one of the four regions participating in the study.

Olga Alexandrovna is a principal and chemistry teacher. She described her initiative to provide her staff with additional training opportunities beyond what the informatics teacher was providing.

Our director of information technology conducts courses for teachers and also we had Intel courses here and they gave us a lot. Many teachers came here and they taught the school’s administrators and some teachers. It didn’t cost us much. It was our own initiative. I made a kind of treaty with them as (our town) is a resort area. So we invited them to have a rest here and provided lodging and food for them in exchange for the knowledge they gave. And so we are very glad to raise the level of computer literacy of the school administrators, myself included. (Transcript 19, May 14, 2007)

In discussing the reasons why some of the teachers in her school are motivated to use computers, Olga Alexandrovna shared some of her incentives for rewarding teachers who use educational technologies.

I think (teachers are motivated by the) more successful results that they can achieve. And of course I raise the salary of such teachers. And when the students get some awards for presentations and competitions, I pass some additional money to the teachers for this. Of course we're moving toward working as a market and so teachers should know that their results affect their salary.

(Transcript 19, May 14, 2007)

Galina Sergeevna, a teacher in Olga Alexandrovna's school, said this about the administration's support of teachers learning computers in her school.

They do all that is possible. At first we had one computer class. Then we got another one. And we have computers in some of the classrooms and a multimedia projector and we can go to the different classrooms and have classes there. And they buy a lot of disks and programs. We also cooperate with Tomsk University. And we have the Internet here now free of charge. This is just due to the administration. Of course they are really interested in our attempts. They try what they can and they do what they can and they help in all possible ways. Though it's sometimes financially difficult and it all depends on finance. But still they do what they can. (Transcript 21, personal communication, May 14, 2007)

Nadezhda Petrovna, a German language teacher, had this to say about her school's administration. "The principal is very wonderful. We must say this for the principal, she tries to introduce all of the technologies, organizes trips to other schools in Gorno-Altai to see how they work with computers, so we can experience it" (Transcript 13, personal communication, April 14, 2007).

Overall, comments about administrative support at the school level were positive (57 percent positive vs. 22 percent negative). All of the negative comments stem from five participants representing three different institutions in one region. Comments ranged from a general lack of support and interest ("doing nothing concrete" in the words of one teacher) to reducing the amount of educational technology resources in the school. The Ministry of Education has provided each school with a set of CD ROM disks containing

the “Golden Lessons of Russia.” These are multimedia curricula. Peter Ivanovich, an informatics teacher, reported that the principal of his school “gave ours away to people outside of the school” (Transcript 24, personal communication, May 23, 2007). Peter Ivanovich also had this to say about the administration of his school:

As for me, the administration gives nothing to me personally. This is my voluntary work, my initiative. Our administration consists of people who are rather old, in their 60s. And there is a concrete problem with the headmaster. She’s not interested in involving or introducing education technologies. (Transcript 24, personal communication, May 23, 2007)

Evgeny Alexandrovich, an informatics teacher at another school in the same region reported that when requesting support for educational technologies “we go to the administration and get refusals.... The authorities tell us we have to use these new technologies, but in reality they don’t provide equipment” (Transcript 2, personal communication, October 27, 2006).

Summation of School Level Training and Support.

Training and support for teachers learning to use educational technologies is provided at the school level as well as at the federal/republic level. Statements from teachers indicate that training opportunities at the school level are an important component of teachers learning educational technologies. It is at this level that support of the administration, assistance and training opportunities form a pathway and support network for teachers beginning the process of learning educational technology.

Approach to Teaching Teachers

Eighteen out of 28 participants made comments related to the methods and techniques of teaching teachers and adult learning principles. These statements were generally focused on 1) the differences in teaching adults versus children, 2) adult learners requiring or demanding a practical or needs based approach to their learning, 3) learner driven approaches, and 4) developmental issues.

Thirty-four percent of participants with statements related to adult learning principles identified differences in teaching adults and children. These were informatics

teachers who had experience in teaching both adults and children. Peter Sergeevich, an informatics teacher, discussed how he teaches differently when working with adults.

Of course the way I teach is different, because these are my colleagues and the way I talk to them is different. Sometimes I say the way we do it with our pupils is this way, and I ask them is it suitable for you to learn it this way or maybe you can suggest something different. I'm always looking for something new or different. (Transcript 11, personal communication, October 22, 2006)

Fifty-six percent of participants with statements related to adult learning principles discussed or gave examples of how adult learning with respect to educational technology is a needs driven process. Teachers of other teachers recognize that their adult students require a practical, hands-on and need-based approach to their learning. Learning activities are focused on what skills are needed and are tied to their work as teachers. Where possible, courses are tailored to specific subjects, like foreign language or Russian literature. Another example from Peter Sergeevich demonstrates how the infusion of computers in his school led teachers to begin learning how to use them.

Now there is a computer in the library, in the teachers' office, the psychologist has his own computer. It's not like before when there was only one computer classroom. They came to me when they realized that they didn't have the knowledge to use computers. When they first came, they were afraid of computers. I had to explain everything. They wrote down every step in the process. So they use the computers for their work. They know the elementary procedures, the simple things they need. This is how their knowledge grows. (Transcript 11, personal communication, October 22, 2006)

Related to a practical, needs-based approach to learning is the notion that adult learners are capable of determining their own educational needs. Forty-five percent of participants with statements related to adult learning principles acknowledged the adult education process as being learner driven. Teachers are deciding for themselves when and what they need to learn. When Victoria Pavlovna, a literature teacher and vice principal, began learning computers, it was driven by her position as an administrator. She grew into using it in her teaching and what she learns is determined by what she

wants to do and know and she reports that “very gradually, step by step, I am mastering it” (Transcript 17, personal communication, May 4, 2007).

Developmental issues are also recognized as a factor in teachers learning to use educational technology. Thirty-four percent of participants with statements related to adult learning principles identified developmental issues, specifically aging, as a factor in the learning process. Aging is viewed as an impediment to learning the process by some, but also can be a barrier to engaging in learning educational technology.

Integrating New Knowledge and Skills into Practice

Allowing teachers time to integrate their new knowledge and skills into practice is the second of King’s critical factors for perspective transformation (2002). Although opportunities for training in educational technology and time to participate in gaining new information and skills are provided at the federal/republic and school levels, time for integrating these skills into practice is not as well supported. Ten teachers cited time as a limiting factor in their ability to acquire new skills and/or to put them into practice.

Galina Nikolaevna, an English teacher, provided a good example of how busy and full life is for teachers, especially in rural areas.

I tried to learn computers here, but I teach 30 hours a week in the classroom. And I don’t have much time...If I had time, I would attend courses, I would go out to all the classrooms where there are computers. I finish my lessons at half past two. And I have a home, cows, dogs, daughters, granddaughters, grandsons.

(Transcript 14, personal communication, April 25, 2007)

Despite her lack of time for utilizing educational technology, Galina Nikolaevna is dedicated to eventually making it a larger part of her teaching. Last year she won an award from the government for her teaching and with the funds bought a computer for her home. Her daughter is “her only teacher” and she told me “when my daughter goes to study, I will probably bring the computer here (to school) and the work will be easier. Then I will find some way. I could work during breaks, find time” (Transcript 14, personal communication, April 25, 2007).

Galina Nikolaevna’s example points to another difficulty related to time. Teachers are not only busy and lack time to devote to the utilization of computer skills, but access

to computers and other technologies is also a limiting factor. Although every school now has at least one computer classroom with a dozen computers, the primary use of these classrooms is for teaching informatics classes to students. Beyond the computer classroom, many schools have only a few other computers available for teachers to utilize. Yuri Borisovich, an informatics teacher, is able to make his computer classroom available for teachers only one day a week, “but not all teachers have time to work on that day” (Transcript 7, personal communication, October 19, 2006). At many schools, when teachers choose to utilize educational technology by integrating its use as part of classroom activities (ex. using computers for presentations), they must relocate their students to the school’s computer classroom. This fact alone creates a large barrier to teachers’ ability to integrate the use of educational technology into their teaching. Nadezhda Petrovna, a German teacher, had not yet used a computer during her teaching, despite her desire to do so because “we’ve got only two computer classes and of course they are always full and of course it’s difficult to work there” (Transcript 13, personal communication, April 18, 2007).

Even schools with more computers than Yuri Borisovich’s still have resource and access issues. Olga Borisovna’s school received a Presidential Grant of one million rubles (\approx \$37,000) to help provide resources for the school. Part of this award was used to obtain additional computer equipment for teachers’ use, giving some teachers more access to computers for preparing and teaching lessons. Still there are access issues. Olga Borisovna, a history teacher and principal, stated, “If I give a class in history using the computer, another teacher won’t be able to use it at the same time” (Transcript 4, personal communication, April 11, 2007).

The lack of access to computers for continued learning and utilization of learned skills is detrimental to the knowledge that teachers gain from their time spent in trainings. Teachers with computers at home have the advantage of better access, but not all teachers have computers at home. Maria Victorovna, an elementary school teacher, provides an example of how lack of access to a computer undermines training.

And then when our school bought computers we had a chance to work with them here and we had a course here which I visited, but the problem was that as I didn’t

have a computer at home, most of the knowledge I got here I forgot after one week. (Transcript 12, personal communication, April 18, 2007).

Informatics teachers Evgeny Alexandrovich and Peter Ivanovich offered solutions to the problem of teachers lacking time and access to integrate educational technology into their teaching. Evgeny Alexandrovich suggested that “we need high-speed Internet so that it works throughout the whole day and night and at any time any teacher or any student could come and work with it” (Transcript 24, personal communication, May 23, 2007). Peter Ivanovich added “teachers should be given time for learning computer technology. And perhaps money, it’s also a kind of work” (Transcript 24, personal communication, May 23, 2007).

The practical ability of teachers to integrate their newly gained knowledge and skills into their teaching is hindered by two factors: time and access to educational technology. At the time of this writing, teachers were not given release time from other duties in order to devote time to utilizing their new computer knowledge. Perhaps more importantly and a concern noted more frequently than time alone, was the limited access to computers on the part of teachers. Without the technology and equipment to practice and develop their skills, the efforts to provide training and support are undermined.

Collaborative Approach to Developing New Curricula and Using New Skills

King’s third critical factor in perspective transformation for teachers is a collaborative approach to developing new curricula and using new skills (2002). Fourteen teachers in the study had statements coded under this criterion. Collaborations were generally limited to within a teacher’s own school and focused more on using new skills rather than on developing new curricula. Informatics teachers were the only teachers to refer to collaborations outside of their own schools; these were with informatics teachers at other schools or the university. Collaborations within schools can involve informatics teachers or be between teachers of other subjects. Evgeny Alexandrovich, an informatics teacher, works with a geography teacher in his school to teach lessons involving learning in both subjects (Transcript 2, personal communication, October 27, 2006). Yuri Ivanovich, also an informatics teacher, described a situation in which a teacher’s learning

about computers led to continued cooperation, as both teachers possessed skills the other lacked.

There is a case of a teacher who was completely illiterate about computers the previous year. She couldn't even type. She's a deputy director on methods of teaching...She was in the group and mastered the computer and now she helps me. I'm not that good in methods. I can do things technically, so she helps.

(Transcript 8, personal communication, October 18, 2006)

As teachers are learning to integrate educational technology into their teaching, they help other teachers as they learn. Victoria Pavlovna, a Russian language and literature teacher and vice-principal reported that she and a colleague worked together to use educational technology as they were going through a recent attestation. She also discussed how teachers are helping each other during the learning process.

Sometimes they (other teachers) even ask me for help. We've got very good relationships in the school and no one is ashamed of asking for help. And anyone is ready to help. Most of the teachers are middle aged or a little older. Of course they have to ask each other all the time. (Transcript 17, personal communication, May 4, 2007)

Collaborative activity among the study participants is evident in the area of learning and implementing new skills. There was little direct evidence of teachers collaborating to produce new curriculum yet. This could be related to where the participants are in the process of transformation. As discussed in the section "Teachers' Uses of Educational Technology", the teachers in this study have not yet demonstrated that they have progressed to the stage where they are ready to transform their curricula.

Summation of Critical Factors for Facilitating Perspective Transformation

King's (2002) critical factors for facilitating perspective transformation among teachers learning educational technology are 1) training and support, 2) time to commit to learning and integrating new knowledge and skills into practice, and 3) a collaborative approach to developing new curricula and utilizing newly acquired skills. Efforts to teach teachers how to use educational technology in the Altai Republic were analyzed at the federal/republic and school levels through the use of data collected from school teachers

and administrators, CEE/ITT staff, and direct observations. In terms of training and support, efforts in this area are very strongly supported at all levels by both the federal/republic government and in schools, though cases of limited support at the school level were reported in one region. Time to commit to utilizing and integrating the knowledge and skills provided is an area which is lacking, mainly due to limited access to computers in many schools. Collaboration among teachers is occurring, but is largely limited to learning and using skills, not in the area of developing new curricula.

Mezirow's Perspective Transformation

Mezirow's transformative learning theory (TLT) was used as the framework for investigating any perspective transformations related to educational practice that school teachers in the Altai Republic may be experiencing during the process of learning educational technology. TLT is intended as "a comprehensive, idealized, and universal model consisting of the generic structures, elements, and processes of adult learning. Cultures and situations determine which of these structures, elements, and processes will be acted upon and whose voice will be heard" (Mezirow, 1994a, p. 222). There are ten stages in the process of perspective transformation. Data from participants were coded according to these ten stages.

The Disorienting Dilemma

Transformative learning processes are thought to be initiated by a disorienting dilemma or trigger event. This dilemma is usually an unexpected event that leads one to discomfort or perplexity. Originally conceived of as a singular event, subsequent exploration has led to the disorienting dilemma as also being viewed as a series of smaller events that may result in the initiation of transformative learning (Cranton, 1994).

Participants in this study discussed three elements which could be contributing factors in the initiation of transformative learning processes: 1) the necessity of computers in modern life, 2) changing expectations of teachers, and 3) fear of computers/technology. Twenty-four of the participants in the study had statements coded with respect to these elements. Table 4-5 below provides a numeric overview of their statements.

Table 4-5. Factors Contributing to the Initiation of the Transformative Learning Process

	Factors contributing to a disorienting dilemma		
	Necessity of Modern Life	Changing Expectations	Fear of Computers
Number of participants (24 total)	11	17	12
Percentage of participants	63%	71%	50%

Necessity

Sixty-three percent of participants with statements coded for the category of disorienting dilemma made comments related to the notion that computers and the skills to use them are a necessity of modern life. Computer technologies are viewed as playing a role in the future of all of today’s students, no matter the profession they choose. Olga Borisovna, a school principal, shared her vision of the future and her motivation for the continued computerization of her school.

Looking to the future, I see the use of computers in every sphere, in agriculture, in medicine, in the home. We should prepare the child for life and to use computers in all these spheres. So students, when finishing school, can adjust to any situation and are ready to use computers in any sphere, in further education, in agriculture if he wants to become a farmer. (Transcript 4, personal communication, April 11, 2007)

The use of and knowledge about computers and technology is not only viewed as a necessity in terms of preparing students for their future profession, but also seen by some teachers as a necessary component of teaching today. Vera Ivanovna, a chemistry teacher and vice principal, shared her thoughts about how necessary computers have become to her teaching.

Five years ago, I had a class with the help of the computer, just because I was interested in it. And now I feel the need. If I don’t use it, if I don’t know how to

use it, I won't be able to work at all. Changes take place very quickly. (Transcript 4, personal communication, April 11, 2007)

Changing Expectations

Related to the notion that computers are a necessity of modern life are changing expectations of teachers with respect to educational technology. Seventy-one percent of participants with statements coded in the category of disorienting dilemma made comments related to changing expectations of teachers. Prior to the push for the computerization of schools, all documents relating to teaching (lesson plans, reports, student records, visual aids, etc.) were handwritten. In the past few years, this expectation has changed and documents are required to be computer generated. All teachers are expected to conform to this expectation, which for many of them was an unexpected turn of events. Maria Alexandrovna, a geography teacher for sixteen years, summed up this situation. "It is difficult to predict anything nowadays, because life is going fast and changes take place very fast. When I was studying to be a teacher, I didn't even imagine I would have a computer" (Transcript 3, personal communication, April 11, 2007). Olga Borisovna, a principal and history teacher for thirty-nine years said, "When we first started working, we didn't even know what computers were" (Transcript 4, personal communication, April 11, 2007).

Peter Sergeevich, an informatics teacher, discussed the situation at his school and the motivation for his colleagues to learn how to use computers.

Now they want to learn how to use the computer mainly for paperwork. What has changed is the tendency, the attitude of the authorities toward the papers they get. They think that when the teachers give documents for certification, they should be printed using a computer and printer, the application should not be on a page ripped from the copy book as it was normally done for 50 years. There is the expectation that the computer will be used. The teachers are motivated by these expectations. (Transcript 11, personal communication, October 22, 2006)

It is not only in the area of paperwork that expectations are changing for teachers. It is in the classroom as well. Galina Nikolaevna, an English teacher, reported that her "students demand it (the use of the computer) all the time" (Transcript 14, personal communication, April 25, 2007). Maria Alexandrovna, the geography teacher, also noted

that her subject area demands the constant use of new information available to her only with the aid of technology.

The computer is everything now, it helps me a lot. Always there is new material there, up-to-date information, because the world is changing all the time and textbooks can't reflect these changes. If we use a textbook published five years ago, it can't reflect these changes. I am a teacher of geography and I work with data every day. I have to watch the news and what happens in the world everyday. So I have to know a lot of up-to-date information. (Transcript 3, personal communication, April 11, 2007)

These changing expectations are also beginning to emerge in the area of resources and materials. Olga Borisovna, the principal whose school won a million ruble federal grant, discussed plans to acquire more technological resources for her school.

When we started computerizing schools, we understood maybe a little bit later how important it is. And if we win some other grant, we wouldn't buy visual aids, we would buy computers. The million that we won, 70 percent was spent on buying some aids - teaching aids, books, textbooks, maps, schemes, schedules. And we bought computers; Thirty percent was spent on this. But we understood when we did it, that we should have spent more. With the projector it makes it better, it can replace all visual aids. (Transcript 4, personal communication, April 11, 2007)

Some knowledge of educational technology is also an expectation for teachers as they go through 'attestation,' the process by which a teacher's growing competency and skills are reviewed and salary upgrades are given by the administration. While the use of educational technologies is not a formal requirement of teachers, Peter Sergeevich explains that it is an informal expectation of teachers.

It's not like they (the administration) formally force teachers to take the courses, but they show them that every high qualification teacher needs to know the computer and needs to know how to use the new technologies in the process of teaching. (Transcript 11, personal communication, October 22, 2006)

Fear of Computers

The third element which may be a contributing factor in triggering the process of transformative learning among teachers learning to use computers is fear. Fifty percent of participants with statements coded in the category of disorienting dilemma made comments about their own or other teachers' fears about learning to use computers. Galina Nikolaevna, an English teacher, discussed her reticence to use computers at the school for teaching lessons, despite the fact that she owns her own computer.

I'm used to my computer and I can't do it here with another computer. I'm afraid; this is not my own computer. I'm afraid to spoil something. Often we are afraid of computers. We're middle aged. When we were born, our generation, we had only radio and no TV. So adjusting to technical innovations is difficult. (Transcript 14, personal communication, April 25, 2007)

Yuri Ivanovich, an informatics teacher, discussed his experiences in teaching teachers to use computers. "Many of them really feared the machines. And for all the people, computers are something strange. They are afraid to play with the buttons, are afraid they will break them" (Transcript 7, personal communication, October 19, 2006).

Summation

For teachers in the Altai Republic, contextual factors may be considered triggering events for the initiation of transformative learning processes. Evident in the comments of several of the study's participants (86 percent of the 28 participants) are indications that there is a societal recognition of the necessity of computers and technical knowledge for everyone. This has led to changing expectations of teachers, who are now expected to be able to utilize technology in both their administrative work and in teaching their students. Fear of technology in such a context may only serve to make it more disorienting and more likely to serve as an impetus for launching some teachers into a process of transformative learning.

Self-Examination with Feelings of Shame or Guilt

According to Mezirow's process of transformation, disorienting dilemmas can be followed by feelings of shame or guilt. This leads to a period of questioning and exploration of new ideas and perspectives.

Within the context of this study, the stages of self-exploration and disorienting dilemma were closely aligned and difficult to separate. It was also difficult to elicit statements from participants about this more personal and internal aspect of the process of transformation. Sixty-three percent of participants with statements coded for the category of disorienting dilemma made reference to the necessity of computers. These statements were generally elicited when asked the question of why they chose to begin learning computers. This could indicate that as a result of changing expectations of teachers (a disorienting dilemma), these participants chose to learn computers as a result of self-exploration leading them to conclude that it was necessary for them. Eight participants had statements coded specifically for the category of self-examination. Participants were as likely to talk about instances of self-exploration in terms of individual experiences as in terms of group experiences.

Maria Alexandrovna, a geography teacher, discussed her decision to begin learning computers. She stated that she embarked on this process because “I understood that it’s very convenient, you can do a lot more than without it” (Transcript 3, personal communication, April 11, 2007). This is a possible indication of her process of self-exploration. At some point, Maria Alexandrovna realized that she could be a more effective teacher if she learned how to use educational technology.

Victoria Pavlovna, a Russian literature teacher and vice principal, discussed the decision of her school’s teachers to begin learning to use educational technology. The teachers in her school made the decision to begin using educational technologies in order to raise the motivation of the students. They made this decision after guests at a conference hosted by the school gave demonstrations of how they were using educational technology in their teaching.

And they used the encyclopedia and demonstrated how it can be used, what can be done with it. And I think that particular conference pushed us to start.

Elementary teachers, teachers of math didn’t use information technologies last year and this year they began. Maybe it was a kind of envy, something like this pushed us. (Transcript 17, personal communication, May 4, 2007)

Like Maria Alexandrovna, the example of the teachers in Victoria Pavlovna’s school could be evidence of their engagement in self-exploration. They had an experience

in which new information led them to the realization that action on their part could help them achieve a goal, higher motivation of their students to learn.

According to Mezirow's theory of perspective transformation, the stage of self-examination is often accompanied by feelings of shame or guilt (1991). Participants in this study gave little evidence of feelings of shame or guilt accompanying their self-exploration. Galina Sergeevna, a Russian literature teacher, was the only participant in this study to mention any feelings of shame. In this instance, Galina Sergeevna was discussing her and her colleagues' experiences in a CEE/ITT training workshop. "Sometimes we didn't ask a question because we were ashamed to ask something if we didn't understand, as we were already grown up and it was shameful for us to admit that we didn't know something" (Transcript 21, personal communication, May 14, 2007).

One of the indications of a changing perspective is a reevaluation of personal responsibility and power and the role of the individual in making change happen. Fifty-two percent of the school teachers in this study made comments reflecting their opinions on responsibility. Sixty-nine percent of these participants gave indications of a sense of personal responsibility. These instances were related to personal responsibility for learning (self or others) or shared responsibility of parents, teachers, and students in the learning process or in solving school problems. Boris Vladimirovich is an informatics teacher, whose school has a second computer lab, which was funded by parents. This school also houses a certificate program for information technologies, necessitating additional infrastructure. Boris Vladimirovich describes the need for seeking help from parents.

And of course parents sometimes help. The second classroom with computers was installed just on money from parents. Although we have this information technology center, as far as the president of schools is concerned, all schools should have equal opportunities so there is no additional support, only the support that all schools get. So we had to find additional funds. (Transcript 1, personal communication, October 2, 2006)

Thirty-one percent of participants who made statements about responsibility didn't feel that teachers had a role (or were not allowed one) to play in solving the problems with the educational system (which largely entail finance). Maria Victorovna,

an elementary school teacher, shares her reaction to a Ministry of Education program to help address school finance.

All people say it's the government's responsibility. The thing is that there is a program suggested by the government, the ministry of education, of how teachers should work and earn money for the schools. To organize some activities which brings additional money and I'm completely against it. We have to teach and haven't spare time for this. It's two different things. (Transcript 12, personal communication, April 18, 2007)

Critical Assessment of Assumptions

One of the key elements in perspective transformation is critical reflection on previously held assumptions or distortions. The three areas in which reflection on assumptions or distortions occur are epistemological, psychic, and sociolinguistic. For the purposes of this study, critical reflection on epistemic assumptions and distortions was the focus of the analysis, due to the study's focus on teachers and education. However, Mezirow (1994a) noted that there is overlap between the three areas and that the assumptions and changes in assumptions in one area can affect the other two areas. There is evidence of this overlap in the data collected during this study.

Thirteen participants in this study had statements coded in the category of critical assessment of epistemic assumptions. Of these, 46 percent (six participants) indicated questioning or changes related to the area of sociolinguistic assumptions and 23 percent (three participants) made statements related to the psychic area.

The participant with the strongest indications of making critical assessments of previously held assumptions was Olga Borisovna, a principal and history teacher. Olga Borisovna describes her changing opinion of the role and utility of educational technology as a result of her school's winning a one million ruble (\approx \$37,000) grant. As described in the earlier section on disorienting dilemmas, Olga Borisovna expressed that more of this award should have been spent on innovative educational technology rather than traditional educational materials (30 percent versus 70 percent) and that she intended to reverse this figure when the school receives its next million ruble grant. She described

the process she experienced when coming to a new realization of the role that educational technology has in schools.

This recognition, this understanding comes when teachers start working in the classroom with computers. So we didn't even realize how much the computers can allow us to do. When I myself saw the computer and projector and how much information the Internet can give, how much we can show and tell and how much easier it can be when using the computer, more effective and productive....When you don't know it, of course you don't know anything about it. When you use it, you have the opportunity to compare. (Transcript 4, personal communication, April 11, 2007)

Olga Borisovna continued discussing the process of how her worldview had changed throughout her career.

(My) world outlook is changing, is entirely different. Several decades ago, our world outlook was imposed. Nowadays it's not so much imposed as it was several years ago...Now when some event takes place, you have to analyze this on your own, instead of being told, being informed. (Transcript 4, personal communication, April 11, 2007)

She connected the changes in her own world view to the changes in Russian society and their impacts on today's educational system.

It happened when we started to know more about the world. More information, some books, with the appearance of the TV, we were able to see how people live and people's lifestyles in many other countries outside Russia. And so our world outlook started to change together with our life. When we knew little about other countries and we couldn't travel abroad, we had the world outlook which was taught. And nowadays, each child, each student has his or her own world outlook. Whatever we tell him he can disagree with us at any time, because his world view can be different, maybe even larger, than a child had twenty years ago. The changes that took place in the country influence changes in the mind. (Transcript 4, personal communication, April 11, 2007)

Olga Borisovna provided a good example of how critical reflection and changes in assumptions in the psychic and sociolinguistic areas are related to and impact changes

in the epistemological assumptions. Alexander Yurevich provided another example of critical reflection across the three areas. He is an informatics teacher and discussed his observations of changes in his colleagues' assumptions as they learn to use educational technology. He identified a psychological barrier that must be overcome during this process.

They cannot understand that the computer is the friend of the human being. But contemporary society is developing forward and the outlook of people, of teachers, is changing. They use computers now. They start to understand that it is easier to process documents. It is easier to make presentations using Microsoft PowerPoint. The subjects taught are becoming more interesting and they have some visual support and besides teachers are able to raise their level of professionalism. (Transcript 2, personal communication, October 27, 2006)

Alexander Yurevich went on to discuss another psychic distortion or assumption that may have affected some of his colleagues in the epistemic area as well. At his school, some teachers near retirement age have purchased computers. Alexander Yurevich's reflections on this phenomenon may elucidate a process of reflection that those teachers are experiencing with regards to their identities as educators.

They used to be exemplary teachers and then something new appears and they want to master it. They buy computers. Why buy? Spend money on something different, something you need more. But they buy to feel more freedom and convenience. (Transcript 2, personal communication, October 27, 2006)

Alexander Yurevich also critically reflected on the motives of the government to spend significant amounts of money to computerize Russian schools.

If we look at how the education policy changes in this country we'll see that, for example, the existing national priority project of giving Internet access to schools, it helps some companies, like (a Russian IT firm). Many journalists said that this company is going to become bankrupt. And the Ministry of Education gave quite a great sum of money to them. I think that this policy was invented for the company. (Transcript 2, personal communication, October 27, 2006)

While Olga Borisovna and Alexander Yurevich demonstrated how critical reflection in one area may be related to other areas, they are not representative of the data

collected in this category. Fifty-four percent of the participants with statements coded for the category of critical reflection gave evidence of having critically reflected in the area of epistemic assumptions only, which may be a reflection of research protocol being focused on this particular area of assumptions.

Eight years ago Tatiana Davidovna, who has taught elementary school for thirty years, made the decision to use a critically reflective teaching methodology in her classroom. She is one of only three teachers in her school to adopt this method of teaching. When asked about her own process of preparing to teach in a dramatically different way, she reported that “you have to reconstruct your own way of thinking” (Transcript 15, personal communication, April 27, 2007). She explained her reasons for voluntarily adopting this new methodology, which provides a clear example of critical reflection in the area of epistemological assumptions.

Today there is too much information. And this program is the result of taking the best of the traditional program. The program that was traditionally used couldn't help children learn all the information that we have now. It was more like standing in one place. (Transcript 15, personal communication, April 27, 2007)

Recognition of Shared Experiences

Stage four of Mezirow's transformative learning theory regards the recognition that one's discontent and the process of transformation are shared and that others have negotiated a similar change (1991). While many participants experienced repeated opportunities for recognition of shared experiences via their learning activities (courses, trainings) or interactions with colleagues from other regions, only two participants made statements indicating this recognition.

Galina Sergeevna, a Russian literature teacher, discussed her experience at a CEE/ITT training. “I took something from those courses and we also shared our own experience there, how we used computers in our own work. So it was helpful, rather useful” (Transcript 21, personal communication, May 14, 2007). Victoria Pavlovna is the Russian literature teacher and vice principal at whose school the teachers decided to learn educational technologies following a conference with their peers. She had this to say about the experience, “so having held these two conferences and seeing with our own

eyes the possibilities of computer technologies, we just connected with it and decided to (learn educational technologies)” (Transcript 17, personal communication, May 4, 2007). This comment is indicative of some recognition and connection with peers undergoing similar challenges.

Exploration of Options

In Mezirow’s fifth stage of transformative learning, learners engage in an exploration of options for new roles, relationships and actions. Teachers who participated in this study demonstrated varying degrees of exploration in the areas of action, roles, and relationships.

Exploration of options for new actions is the most visible and easily quantifiable area identified among the teachers participating in this study. The majority of teachers discussed actions they had taken with respect to educational technology that could be indicative of exploration. Seventy-two percent of teachers in the study have engaged in training in the area of educational technology, either in their own school or a CEE/ITT workshop. Eighty-four percent of teachers reported that they have used educational technology either to support and supplement their curricula or have begun integrating it into their curricula. Sixty percent of non-informatics teachers have purchased their own personal computer.

Beyond the realm of actions, there is also evidence that some teachers are exploring options for new roles based on their newly acquired knowledge and skills. A few non-informatics teachers (27%) are developing their skills as providers of help in the area of information technologies. Yulia Ivanovna, an English teacher and vice principal, discussed how her (and her colleagues’) participation in a CEE/ITT training led them to be able to take on the role of helping others with the use of educational technology. Prior to their training,

It was only (the informatics teacher) who could do it, (make) such projects, such presentations. And that’s why seven or five of our teachers studied at this course. That’s why nowadays we can help other teachers to prepare different projects or presentations, for example. (Transcript 16, personal communication, April 27, 2007)

Aside from exploring new roles within their current professions, a few non-informatics teachers (13 percent) identified how the learning of educational technologies could lead them to different roles completely. Again from Yulia Ivanovna:

I think that nowadays I can work not only with teachers. Nowadays, every profession needs computer knowledge. And now you may go somewhere (else), to another office for example and you may be sure that you can use it in this sphere, not only teaching, but in different spheres. (Transcript 16, personal communication, April 27, 2007)

The process of learning educational technology is also leading some teachers to explore new relationships with their students. Twenty percent of all teachers participating in the study discussed the impacts that the use of educational technology has on teachers' relationships with students. Overall, the impact is discussed as leading to a greater respect for teachers on the part of students and closer relationships between teachers and students. Tatiana Davidovna is an elementary school teacher who has been teaching for thirty years who began using educational technology one year ago. She now teaches basic computer skills to her students.

I think children when I started to teach them some basic things in IT, they began treating me better than they did before. And we started to speak the same language. We're becoming on equal terms. If they find out the teacher knows something well, such as computers, their attitude is different. They really respect them and appreciate them. Without knowing something about the computer, I can't imagine how we would communicate. We wouldn't understand each other. Pupils come with their own problems and we can discuss them. And now we do understand each other. (Transcript 15, personal communication, April 27, 2007)

The teachers in this study provided evidence that they are engaging in exploring options for new relationships, roles, and actions.

Planning a Course of Action

The sixth stage of Mezirow's transformative learning theory entails planning a course of action. The majority of teachers participating in this study (84 percent) gave indications that they had planned a course of action, either related to past action or

actions yet to be taken. Seventy-two percent of teachers discussed past actions taken (such as participating in a training course or buying a computer). Fifty-two percent discussed future actions they are planning to take. Actions planned by teachers include individual actions and programmatic actions. Individual actions are actions taken for the person's own benefit or of benefit to their immediate work, such as taking additional courses or developing materials for their own classes. Programmatic actions include creating programs for training teachers, creating greater access opportunities for teachers and students to use computers, or school-wide programs to expand the use of educational technologies. Of the 21 teachers with statements coded for planning a course of action, 43 percent of them discussed plans for programmatic actions. These types of actions were limited to informatics teachers and administrators.

Yuri Borisovich is an informatics teacher. In order to help address the issue of limited access to the digital resources at his school, he plans "to set up a multimedia center at the school so that teachers and students will be able to work with the material in the library" (Transcript 7, personal communication, October 19, 2006). Alexander Yurevich, also an informatics teacher, planned and implemented a course of action to help prepare students at his school to use e-mail and the Internet.

We have no Internet, but the work with it is included in the program. And I started to find things, find materials, consulted with clever people, and I installed a server and an e-mail (program) and made a local network. My school students can go to the Internet café in the city and work with the Internet so they would not be afraid of it. (Transcript 2, personal communication, October 27, 2006)

Olga Borisovna is the principal of the school that won a one million ruble grant (\approx \$37,000), 30 percent of which was used to increase the amount of educational technology in the school. When asked if she had future plans involving educational technology, she related that she had "great plans. I very much want to join some project and win maybe 5 million rubles (\sim \$192K) to computerize the school to the fullest extent" (Transcript 4, personal communication, April 11, 2007).

Olga Alexandrovna, also a principal, shared that she is "dreaming of having video conferences with other schools in classes and extracurricular activities" (Transcript 19, personal communication, May 14, 2007). Olga Alexandrovna also developed and

implemented a plan to provide higher level computer training for her teachers on site. At her initiative, she brokered a deal with the CEE/ITT program to offer an Intel workshop in the tourist area in which her school is located (Transcript 19, personal communication, May 14, 2007).

While informatics teachers and administrators tend to plan courses of action in the programmatic arena, teachers of other subjects tend to make plans focused on themselves or their individual classroom activities. Maria Alexandrovna, a geography teacher, related very specific plans for developing her skills in educational technology.

I am occupied with using the Internet, learning how to use it. I direct my energy wholly toward this thing. I would like to find a lot more programs connected with my subject and to participate in some projects. I will participate in some grants to win money to buy a computer for my classroom. (Transcript 3, personal communication, April 11, 2007)

The plans of non-informatics teachers include increasing their skills in the use of educational technology by getting more training (particularly in how to use the Internet) and also finding ways to utilize it more in their teaching. Victoria Pavlovna, a Russian literature teacher and vice principal, detailed her plans for the summer.

I've got my plans for summer outlined already. I want to take drawings by children and scan them...All the things, the products that they create, with time they deteriorate, so I would like to preserve them on the computer. I've got lots of plans. I've got a computer at home, a scanner, and printer. Lots of plans for summer. I want to rearrange the plan for each lesson and make presentations for each of them. (Transcript 17, personal communication, May 4, 2007)

Galina Nikolaevna, an English teacher, intends to bring her home computer to her classroom when her daughter goes to university so that she can have more opportunities to develop her skills and use it in her teaching (Transcript 14, personal communication, April 25, 2007).

Teachers in this study have provided evidence that they are engaging or have engaged in planning courses of action with regard to learning and using educational technology in their profession.

Acquisition of Knowledge and Skills

The seventh stage in Mezirow's process of transformation involves the acquisition of knowledge and skills for implementing one's plans. Seventy-two percent of the teachers participating in this study have begun acquiring the skills needed to begin using educational technologies in their work, either by participating in CEE/ITT training or through training offered in their school. One-on-one assistance to acquire the necessary knowledge for implementing their plans is another strategy used by teachers. Twenty-four percent of participants discussed informal learning from their colleagues as a method of learning more about educational technologies. Self-directed learning is also an important method of acquiring new skills, with 60 percent of the participants in the study describing or referencing teachers' efforts at self-education. Maria Alexandrovna, a geography teacher, is an example of a teacher who has participated in all three of these methods of acquiring new skills to carry out her plans. Following her participation in a training course offered at her school, she continued learning on her own and with a group of colleagues. With regard to the formal training, she reported that

I understood it very well and step by step, gradually, I am becoming more knowledgeable. (Following the training), we started to learn by ourselves and learn something new. We got the basics, the basic knowledge and skills and then we continued on our own. (Transcript 3, personal communication, April 11, 2007)

Study participants were very aware of the role and necessity of self-education in their learning. Sixty percent made explicit use of the term self-education in describing their or other teachers' learning. In describing how she manages to keep current with new developments in the rapidly changing sphere of IT, Maria Petrovna, an informatics teacher stated "I had to take a lot of courses in Novosibirsk and teach myself. A lot of self education. Teaching itself presupposes self education, whether you want it or not" (Transcript 6, personal communication, September 22, 2006). Maria Victorovna, an elementary school teacher, also sees self-education as a responsibility. When asked about how the administration of her school supported teachers learning how to use educational technologies, she responded that "The fact that we were given a computer is very good. For the rest, we should do it by ourselves, on our own" (Transcript 12, personal communication, April 18, 2007).

Provisional Trying of New Roles

Stage eight of Mezirow's TLT involves trying out new roles based on the experiences and skills developed in previous stages. For the purpose of analysis, examples of how teachers had changed their classroom and teaching activities was used to provide evidence of their engagement in this stage of TLT. Eighty-four percent of teachers reported using educational technology in their preparation or classroom activities, as discussed in the Teachers' Use of Educational Technology section. This use of educational technology falls into two main categories, supplement/support and integration into the classroom. Specifically teachers are engaging in a provisional trying of new roles by using educational technology to find and incorporate new sources of material into their classrooms and to deliver instruction, assess student learning and engage students in new types of activities.

Maria Alexandrovna, a geography teacher, provides a good example of a teacher trying out new roles for herself in terms of using educational technology in her teaching. When asked what specifically she was doing differently now in her classes that she wasn't able to do before learning how to use computers, she said that "There are a lot of data in the CD disks, for example, which are not available in textbooks, or some recent maps, which are not available either" (Transcript 3, personal communication, April 11, 2007). She uses this material in presentations and then uses computerized assessments to measure the learning of her students. She also uses educational technology in the assignments she gives to her students. She discussed one such assignment.

For example, during a class, the children were told to find information on world heritage sites that are on the UNESCO list. Of course they know that there are some objects, some sites included on this list from Gorno-Altai. But they know nothing about other sites. And so they got really interested in this and they started to find all the materials connected with other sites. (Transcript 3, personal communication, April 11, 2007)

Olga Borisovna, a principal and history teacher, provides an overview of how teachers' classroom preparation has changed as a result of increased computer knowledge and usage, pointing to the teachers' provisional trying of new roles associated with their increased skills and abilities in using educational technology. When asked about the

changes in the school since the increase of computers, Olga Borisovna described how teachers used to prepare for classes and how this has recently changed.

When preparing for classwork and for teaching, the teachers have a very good wish and there appeared a systematic approach to getting ready for their classes...the teachers only teach from morning 'til noon and have no afternoon classes. The teachers have the opportunity to go home after classes and the opportunity to get ready for their classes at home. And the majority first did their work about the house and then started to prepare for the next days teaching. And this system was destroyed because of computers. The teachers stay at school a longer time to get ready for their classes. It became more productive and the teachers do not get as tired as quickly as they used to. And until he is ready for the next class, he won't go home. The computers are here, everything is here. They are energized. So the structure improved and the whole system of preparing for classes improved. And of course classes are more efficient and better. The classes themselves improved. The method of teaching improved. (Transcript 4, personal communication, April 11, 2007)

Most teachers who are engaged in learning about educational technology are provisionally trying out new roles for themselves in terms of their teaching preparation and classroom activities.

Building Competence and Self-Confidence in New Roles and Relationships

A high number of teachers participating in this project gave evidence that they are engaging in the provisional trying of new roles (84 percent), but far fewer provided evidence that they have built competence and self-confidence in their new roles and relationships. Thirty-six percent of participating teachers expressed confidence or discussed their skills in terms that indicated they felt competent and confident in their abilities (such as serving as a consultant to other teachers). Lubova Nikolaevna, an ITT staff member, discussed the results of her work to train teachers in the use of educational technology, with respect to the issue of their competence and confidence.

It was a pleasure to hear that teachers would say that they mastered computers after our workshops. We also tried to do some follow-up to get some feedback on

how efficiently computers had been used by the teachers who took our courses. We trained teachers from practically all schools. And normally when having problems they approached the IT teacher of their own school for consultations. But now many of them can do things themselves and work independently. (Transcript 9, personal communication, September 12, 2006)

Tatiana Davidovna is one such teacher. She is an elementary school teacher who has participated in CEE/ITT training courses. As a result of her experiences and learning she said, “I know how to use the computer and can use different programs and do what I can to help children. Now I can teach others. Some people can’t do anything with a computer, so they don’t want to come near it. And I became confident” (Transcript 15, personal communication, April 27, 2007).

Reintegration into One’s Life

The final stage of Mezirow’s TLT is reintegrating new experiences and learning into one’s life on the basis of the conditions dictated by one’s new perspective. This stage should be evidenced by a change in worldviews. Three participants (12 percent) in this study gave evidence of reaching this stage of TLT.

Evgeny Alexandrovich, an informatics teacher, discussed the benefits of educational technology on teaching.

Of course it has a big influence on my teaching. I make my students love and understand the Internet...Using computers in my classes is great. I can’t imagine my teaching without computers now. It is a modern and powerful method of teaching. (Transcript 5, personal communication, October 22, 2006)

The experiences of Evgeny Alexandrovich in the use of educational technology have resulted in his integration of a perspective or worldview related to education and the role of computers within it and the future of humankind. In discussing the purpose of education, he shared these statements.

Without education, mankind isn’t mankind. Modern life needs education more and more and more. Information is the most valuable thing in the 21st century. Without education, without computers we can’t live in the modern world. And computer science is the main way to teach other subjects in school, like

geography, biology, mathematics, and physics...Future success depends on younger teachers who come and already know how to use computers and know they're important, know the advantages of using them. They can change education. (Transcript 5, personal communication, October 22, 2006)

Olga Borisovna is a principal and history teacher. Her questioning of assumptions was discussed in the previous section on Critical Assessment of Assumptions. She discussed her own changing worldview as a result of the political and social changes in Russia.

(My) world outlook is changing, is entirely different. Several decades ago, our world outlook was imposed. Nowadays it's not so much imposed as it was several years ago...Now when some event takes place, you have to analyze this on your own, instead of being told, being informed. (Transcript 4, personal communication, April 11, 2007)

Based on her changing world view and her experiences with the recent progress in computerizing her school, Olga Borisovna has come to a place where she is wholeheartedly embracing the need for complete computerization of the school.

I very much want to join some project and win maybe 5 million rubles (~\$192K) to computerize the school to the fullest extent... we would like to have a computer in each classroom. Then at the end of the class, the teacher could easily prepare for his next lesson and could more productively do it without disturbing other teachers. (Transcript 4, personal communication, April 11, 2007)

This is a definite change from her previous decision to allocate grant funds to more traditional resources and materials (30 percent educational technology vs. 70 percent traditional materials) and may be indicative of a reintegration of a new perspective into her life.

Few teachers in this study made statements indicating that they had reached the final level of Mezirow's TLT. Those who did were teachers with over 30 years of teaching experience and with mastery level experience in their professions (informatics and administration).

Summation of Mezirow’s Perspective Transformation

Table 4-6 below shows the number and percentages of participants with statements coded at each stage of Mezirow’s transformative learning theory framework. Statements were coded for each stage of the theory, but the number and percentage of statements varied highly. Stage one, disorienting dilemma, had the highest percentage (96%). Stages two, three and four were among some of the lowest percentages (32%, 52% and 8%, respectively), with stages five through eight having relatively high percentages (72-84%). Stages nine and ten also have rather low percentages (36% and 12%).

Table 4-6. Number and Percentage of Participants with Statements Coded at Each TLT Stage

Stage	Number of Participants	Percentage of Participants
1. Disorienting dilemma	24	96%
2. Self-examination with feelings of shame or guilt	8	32%
3. A critical assessment of epistemological, sociocultural, or psychological assumptions	13	52%
4. Recognition that one’s discontent and the process of transformation are shared and that others have negotiated a similar change	2	8%
5. Exploration of options for new roles, relationships, and actions	18	72%
6. Planning a course of action	21	84%
7. Acquisition of knowledge and skills for implementing one’s plans	18	72%
8. Provisional trying of new roles	21	84%
9. Building of competence and self-confidence in new roles and relationships	9	36%
10. A reintegration into ones life on the basis of conditions dictated by one’s new perspective	3	12%

Figure 4-2 is a graphic depiction of the percentages of participants with statements coded for each stage of TLT. TLT is not a linear process, so it is not expected that the lower percentages at earlier stages followed by higher percentages at following stages is an indication that the framework is not an appropriate tool for examining perspective transformation in this context. Rather it points to the inability of the research protocol to elicit this information or a cultural/contextual difference that needs to be more fully explored.

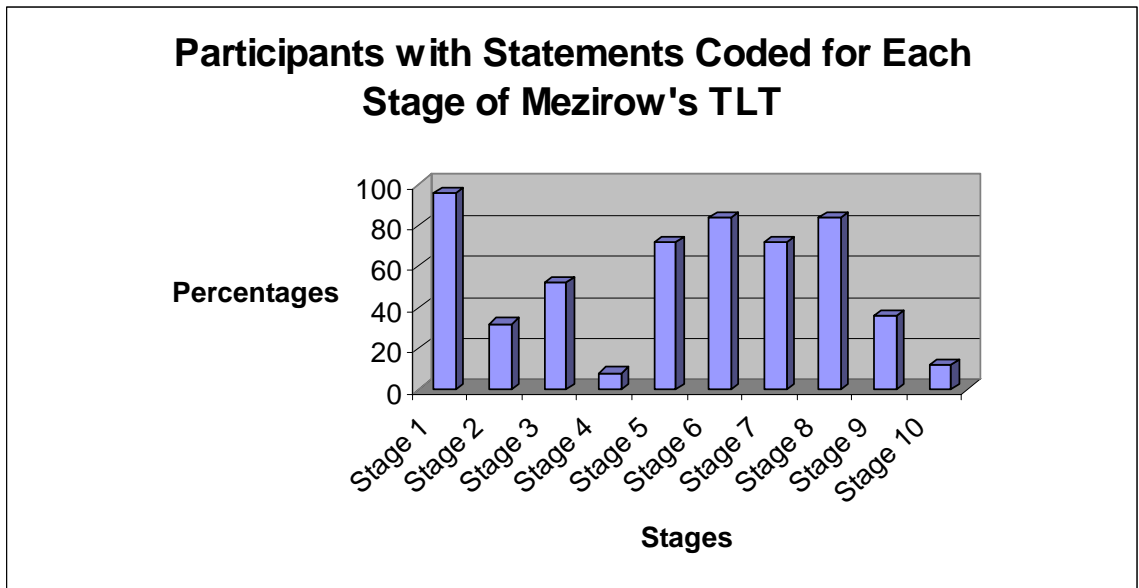


Figure 4-2. Percentage of participants with statements coded for each stage of Mezirow's TLT.

Figure 4-3 below shows each school teacher who participated in the study and the total number of TLT stages for which they had statements coded. Fifty-two percent of participants had statements coded for six or more of Mezirow's ten stages. Twelve percent had eight or more stages coded.



Figure 4-3. Total number of Mezirow’s stages for each teacher participating in study.

Galina Sergeevna and Maria Alexandrovna were two participants with statements coded in nine of Mezirow’s ten stages. Galina Sergeevna is a Russian language and literature teacher in a rural school. She has been a teacher for 27 years and has been learning to use educational technologies for the past six years. She has engaged in both formal courses at her school and through the CEE/ITT, as well as participated in informal

learning in this subject area. Maria Alexandrovna is a geography teacher in a rural school. She has been a teacher for 16 years and has been learning to use computers for three years. She has taken formal courses at her school and relies on informal learning with a group of other colleagues and self-education for continuing her learning in educational technologies.

Peter Ivanovich and Maria Petrovna had statements coded in one and three of the ten stages, respectively. Peter Ivanovich is an informatics teacher at a rural school. He has been a teacher for two years. Beyond his academic training, he hasn't participated in any formal training offered in the Altai Republic. Maria Petrovna is an informatics teacher at a school in the capital city of the republic. She has been a teacher for 27 years and started working with information technologies 15 years ago. She has participated in CEE/ITT training.

Table 4-7. Participants with Highest and Lowest Number of Mezirow's Stages.

Participant	Stages									
	1	2	3	4	5	6	7	8	9	10
Peter Ivanovich							•			
Maria Petrovna					•	•	•			
Maria Alexandrovna	•	•	•		•	•	•	•	•	•
Galina Sergeevna	•	•	•	•	•	•	•	•	•	

Table 4-7 shows the stages for which these participants had statements coded. All participants were coded for stage seven, acquisition of knowledge and skills for implementing one's plans. Each of these participants made statements related to their participation in learning educational technologies and had participated in acquiring skills in a variety of ways, including formal and informal learning, and self-education.

Maria Petrovna, Maria Alexandrovna, and Galina Sergeevna each had statements coded at stages five (exploration of options for new roles, relationships, and actions) and six (planning a course of action). Statements coded for stage five related to participating in introductory training to learn about the use of educational technology, helping others to learn educational technology (in the case of non-informatics teachers), and different/changing relationships and interactions with students. Statements coded for

stage six related to future plans, such as forming a creative group to teach other teachers how to use educational technologies (Maria Petrovna), planning to learn to use the Internet and participate in grant writing to obtain a computer for the school (Maria Alexandrovna), or planning to continue learning about educational technologies through future coursework and self-education (Galina Sergeevna).

Maria Alexandrovna and Galina Sergeevna both had statements coded for nine of the ten stages of Mezirow's transformative learning theory. Maria Alexandrovna had no statements coded for stage four, recognition that one's discontent and the process of transformation are shared and that others have negotiated a similar change. This is a stage in which the fewest participants had statements coded (eight percent). Galina Sergeevna had no statements coded for stage ten, the stage with the second fewest coded statements (12 percent).

If a person has experienced transformative learning, they should possess what Mezirow (1989) defines as a superior perspective.

A superior perspective is more inclusive, discriminating and integrative of experience; is based on fuller information; is freer from coercion or distorting self-deception; more open to other perspectives and points of view; more accepting of others as equal participants in discourse; more rational in assessing contending arguments and evidence; more critically reflective and more willing to accept an informed and rational consensus as the authority for adjudicating conflicting validity claims. (Mezirow, 1989, p. 171)

Statements made by Maria Alexandrovna show that she has at least met some of the criteria for possessing a superior perspective. She reported that over her career as a teacher, she has learned and been changed by her experiences. Specifically she said that she was now "open to anything new, I became communicative, ready to start new communication" (Transcript 3, personal communication, April 11, 2007). She discussed a new perspective she had acquired with respect to the purpose of education. She now feels that "the main goal of education is not to teach children to learn some facts and to fill their heads with facts, but to teach them to learn and find these facts on their own" (Transcript 3, personal communication, April 11, 2007). She said, "Just with the help of my experience, I came to the conclusion that it's better not to just learn something and

memorize something, but learn how to find this particular fact” (Transcript 3, personal communication, April 11, 2007).

She now also has access to fuller information, thanks to computers and the Internet, which not only provide her with the tools she needs as a geography teacher, but have resulted in her understanding that “it was impossible to know everything about the world and that you have to study a lot, all the time” (Transcript 3, personal communication, April 11, 2007). She recognizes the importance of information and knowledge in her life, based on the context in which she lives.

We live far from the center and we see not much because we don’t have chances to go somewhere. So we have to learn more and use internet and computers in order to learn more about other cultures and places. It’s kind of a necessity. (Transcript 3, personal communication, April 11, 2007)

The above statement about the importance of knowledge of other cultures and places indicates that she is open to other perspectives and points of view and has possibly become more so based on her learning and use of educational technologies.

Maria Alexandrovna’s experiences with learning educational technologies may also be resulting in her becoming more accepting of others as equal participants in discourse. She reported changes in her students as she has adopted the use of educational technology in her teaching.

And children, pupils, they treat the teachers who use computers in a different way, they respect them better and the teachers are more interesting for them to communicate with...Children tend to address the teachers more openly, when participating in a certain program or making certain projects or finding some certain information...There’s more communication and interaction. (Transcript 3, personal communication, April 11, 2007)

While Maria Alexandrovna may attribute the use of computers as the cause of increased interaction between students and teachers, it may be changes in the teachers themselves which are creating educational environments in which students feel more comfortable and able to interact with their teachers in new ways.

Alignment of King’s Journey of Transformation with Mezirow’s Perspective Transformation

King (2002) aligns the Journey of Transformation that teachers learning educational technology experience with Mezirow’s Transformative Learning Theory. Table 4-8 below shows this alignment of stages.

Table 4-8. Alignment of King and Mezirow frameworks

Journey of Transformation (King)	Perspective Transformation (Mezirow)
Fear and uncertainty	1. A disorienting dilemma 2. Self-examination with feelings of shame or guilt
Testing and exploring	3. A critical assessment of epistemological, sociocultural, or psychological assumptions 4. Recognition that one’s discontent and the process of transformation are shared and that others have negotiated a similar change 5. Exploration of options for new roles, relationships, and actions;
Affirming and connecting	6. Planning a course of action 7. Acquisition of knowledge and skills for implementing one’s plans 8. Provisional trying of new roles 9. Building of competence and self-confidence in new roles and relationships
New perspective	10. A reintegration into ones life on the basis of conditions dictated by one’s new perspective

(King, 2002, p. 33)

When King’s framework was used to view the data collected from participants with respect to stages of transformative learning a different pattern emerges (See figure 4-4 below). King’s first stage is fear and uncertainty. When participants’ statements were reviewed with this descriptor (fear and uncertainty) in mind, the amount and percentage

of responses for this stage was 40 percent (ten out of 25 participants). King's stage two, testing and exploring, encompass Mezirow's stages three through five. Using King's framework, this stage had statements coded by 76 percent of school teachers, masking the highly varied percentages yielded in Mezirow's framework. King's stage three, affirming and connecting is analogous to Mezirow's stages six through nine. King's stage three also had statements coded by 76 percent of school teachers, which is more in keeping with stages six through eight of the Mezirow analysis, which ranged from 72 to 84 percent. However, Mezirow's stage nine findings (36%) are eclipsed when King's framework is applied. King's stage four and Mezirow's stage ten were identical (12 percent). Figure 4-5 shows a comparison of King's and Mezirow's stages in terms of statements coded from participants.

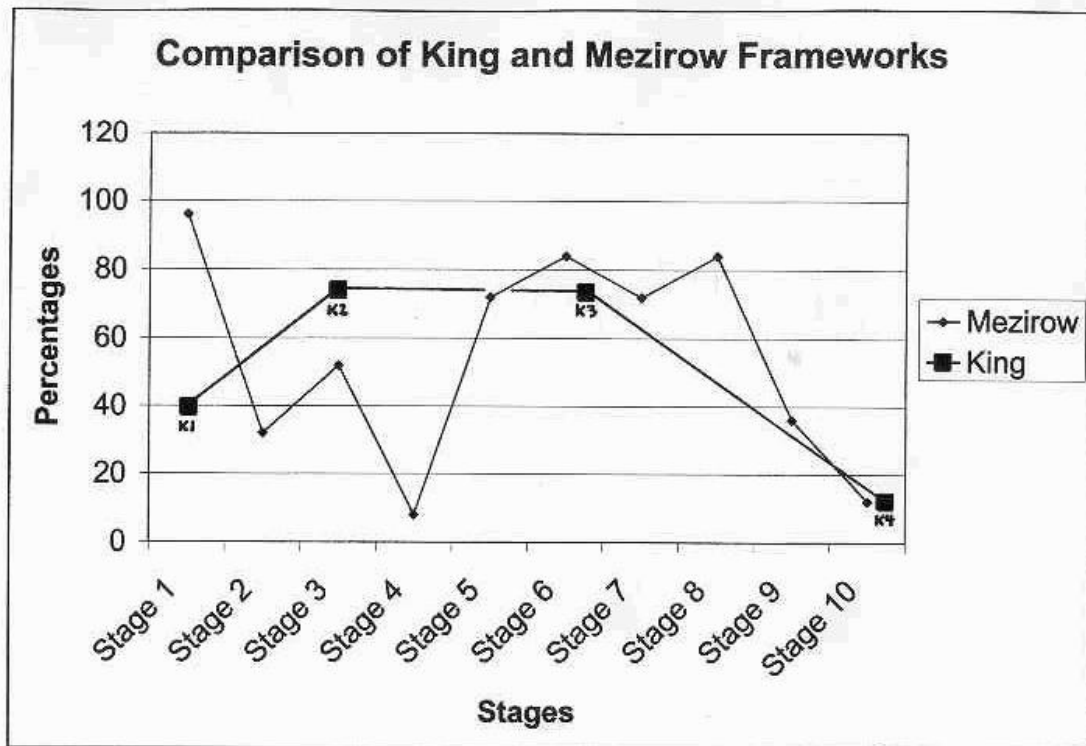


Figure 4-4. Comparison of King and Mezirow's frameworks using data from this study.

Emergent Themes

There were two emergent themes in the data: computers and student learning and changes in the educational system.

Computers and Student Learning

Twenty participants made statements related to student learning and the use of computers in the classroom. These statements can be grouped into four main categories: student motivation, learning processes, attitude toward teachers, and misuse of computers.

Student Motivation

Seventy-five percent of participants with statements coded for the category of computers and student learning made statements related to the increased motivation, interest, and involvement of students. This is directly tied to the use of computers in the educational process. Teachers reported that students are less likely to miss classes where computers are used. Victoria Pavlovna, a literature teacher and vice principal stated, “I think that sometimes the attitude has changed. For example they are more likely to stay for the class, instead of leaving, because they think that they can miss something” (Transcript 17, personal communication, May 4, 2007). In Victoria Pavlovna’s case, the increased number of students in the class is also accompanied by increased engagement. In discussing her use of educational technologies and her students’ reactions, she stated, “They like it very much. They ask questions constantly. The use of these technologies and the use of video raises and improves their motivation for studying” (Transcript 17, personal communication, May 4, 2007).

Learning Processes

Seventy-five percent of teachers with statements coded for the category of computers and student learning made statements related to improved learning processes for students when educational technology is employed. These improvements are related to new and different types of activities that students can engage in, increased quality and quantity of learning, improved ability to use individual approaches with students, and a higher ability for students to learn using a variety of their senses (sight, sound, etc.).

Olga Alexandrovna, a principal and chemistry teacher, discussed how the learning process can be enhanced with the use of educational technology to help provide a multisensory experience for students.

It's one thing when you listen to a teacher and another thing when you see something in the flesh. For example, in geography class they can visit different countries or in chemistry class see how different experiments are made. Using not simply a picture, you can see how animals live, how they move in natural surroundings. And when all the persons are not just listening, the memory improves when you get information from various sources, visual or auditory sources. And when students make projects they use computers, and they don't just get the knowledge they are given, but they themselves find this knowledge. (Transcript 19, personal communication, May 19, 2007)

Many teachers feel that the use of educational technology can help students learn more in a shorter amount of time, making the process more efficient. Yuri Ivanovich, an informatics teacher, illustrated this idea by sharing an example from the experience of a colleague.

High technology helps to make this process faster and it's more interesting for the pupil when they see it on the screen. For example a teacher of physics is actively using multimedia disks and the school was given these by the Ministry of Education. And she said that she can do the same amount of work in a shorter period of time with less time spent on planning and the educational process has become faster. (Transcript 8, personal communication, October 18, 2006)

Educational technology also helps to benefit student learning by giving teachers an improved ability to provide individualized instruction. Galina Sergeevna, a literature teacher, appreciates that she can do a wider range of activities in the classroom with the help of educational technologies, as well as "use an individual approach more easily. I can give different tasks to students at different levels. It was more difficult previously" (Transcript 21, personal communication, May 14, 2007). Vera Ivanovna, a vice principal and chemistry teacher discussed the specific ways computers help a teacher provide more individualized instruction.

The individual approach is more widely used now, in this system, the individual approach to the students. And it's easier for a teacher to check their tests and the teacher can see right away the weak point of the child. And he can pay more attention to this or that topic working in this way. The quality of knowledge is

improving with the use of these technologies. And of course, the interest and motivation is much better. (Transcript 4, personal communication, April 11, 2007)

Attitudes Toward Teachers

Twenty percent of teachers with statements coded in the category of computers and student learning discussed the attitudes of students toward teachers who use educational technology. All statements related to the topic indicated that these teachers earned more respect from students because of their abilities to use computers in their teaching. Vladimir Romanovich, an informatics teacher, discussed his observations of the student/teacher relationship in his school.

They (students) started to like classes and they like the classes where IT is used. They show great interest. It's really interesting for them. Of course the teachers themselves are really interested. And maybe some respect arose as a result of the use of these technologies. (Transcript 18, personal communication, May 4, 2007)

Misuse of Computers

Fifteen percent of teachers with statements coded in the category of computers and student learning discussed a negative side of student use of computers. These teachers felt that some students misused computers, meaning that they were used not only for educational purposes, but playing games or listening to music. Again, from Vladimir Romanovich:

Students are less interested in their studies than they used to be. If they have a computer, they would rather listen to music or play some games rather than reading something. In comparing myself in this respect, I had a computer, but I still kept on reading. And nowadays they don't read much. And they become illiterate because of this. They write little. If they have a computer, they'd rather type. They make lots of mistakes when writing. In this respect using computer technologies can have both negative and positive results. And you should use it in a proper way. (Transcript 18, personal communication, May 4, 2007)

Changes in Education

Changes in the educational system and process, both as a result of the increasing use of educational technologies and social and political changes, were frequently discussed by the study's participants. These changes were related to the purpose of education, the role of teachers, and the role of students.

Purpose of Education

Historically, a major concern of education in Russia and the Soviet Union was the upbringing or socialization of students. This remains true for the participants of this study. Twenty-two participants discussed the purpose of education. Of these, 82 percent cited upbringing (also often termed the development of a harmonious personality or finding one's place in life) as the main purpose of education. While upbringing remains a major concern of the educational system, the means used to achieve this goal have changed. Galina Nikolaevna, an English teacher discussed the changes in the upbringing system over the years of her career.

Nowadays the aim is a little bit different, just to let him be flexible in life. He might be very successful, very educated, well bred in the 70s or 80s. But all that was done was not done by himself, but by his parents, the government, by our country. The idea was that students were developed by all, teachers, parents and so on. And nowadays he is directed in his own development. The person can develop by himself...So we must teach it. Previously we taught children to be the kind of persons we decided they should be. Now we teach them to be themselves. Now I've got a different approach. We used to bring up children by telling them not to steal, or bringing him up in all possible ways. But we knew the bad, negative sides of life at that time. We concealed some negative sides of life, not only us, but the government, the whole country. Now we make them be ready for these difficult situations. (Transcript 14, personal communication, April 25, 2007)

Galina Nikolaevna's statements not only reveal the refocus of the upbringing system, but another change in the purpose of education. Thirty-two percent of participants with statements related to changes in the educational system discussed the development of life long learning skills or self-directed education as a purpose of

education. Victoria Pavlovna, a vice principal and literature teacher, discussed her goals as a teacher and the purpose of education.

To give education and make students able to live further. To become independent and be able to make decisions. Self-education, the percentage of self-education is increasing. They have to study more by themselves...Previously we would give readymade materials, information, and now regularly, the greater percentage of information is not given, but it is demanded that the students learn it by themselves. And computer technologies and critical thinking are a great help. (Transcript 17, personal communication, May 4, 2007)

In addition to creating life long learners and helping students find their place in society, another purpose of education is to provide knowledge to students. Thirty-six percent of participants with statements related to changes in education cited this as a purpose of education.

Related to these issues is the recognition that education has become less authoritarian and less centered on teaching ideology. Three participants in the study discussed this directly and four stated that they felt that teachers now had more flexibility and freedom in their teaching. Peter Sergeevich, an informatics teacher, discussed the changes in the educational system since he was a student.

Study at school was more authoritarian when the task of a student was to listen to a teacher and what he said. And now the gap between a student and a teacher is less and less. Of course there is still respect to the teacher and no one diminishes the role of the teacher in the process, but there is no authoritarian system anymore. (Transcript 11, personal communication, October 22, 2006)

Role of the Teacher

Related to the changes in the purpose of education is the role of the teacher. In Soviet times, the role of the teacher was to provide information to the student. For many of the participants in this study, this role has changed. Twenty-two participants discussed the role of the teacher in the educational process. Sixty-four percent of them stated that a teacher's role was that of a guide, a motivator, and/or a facilitator of learning. Forty-one percent of them also described the teacher's role as being very important to the

educational process. Vladimir Romanovich, an informatics teacher, discussed his view of the role of the teacher.

To show them this truthful way, to show by their own example what can be reached in life, what can be done in life. The teacher must become a kind of helper to each student or sometimes even a substitute parent. I think otherwise it will be difficult, though it's a great responsibility. (Transcript 18, personal communication, May 4, 2007)

Olga Alexandrovna, a principal and chemistry teacher, discussed a school project involving students, teachers, and the headmaster. Her description illustrates her belief that teachers are guides or models for their students.

Students and teachers and the headmaster worked on it. And as far as this is new to us, to make others get involved and to get interested in this, other students, you should first know it yourself. That's why I decided to participate in the project. Previously there was a saying that the teacher was a second mother. And nowadays the role is great and you should show with your own behavior how to do this or that. Computer technologies included. If the teachers can work with a computer, the child gets interested. Those teachers who do not use computers in classes, those children do not get interested in the class. (Transcript 19, personal communication, May 14, 2007)

Related to a change in the role of the teacher is the notion that the work of a teacher has changed. Seven participants discussed their work as being more interesting, more interactive and engaging, and more effective.

Role of the Student

In discussing the changes in education, four participants discussed the changes that have occurred in the students themselves. Today's students "know their rights now, unlike previous students" (Transcript 1, personal communication, October 2, 2006). Some teachers feel that "because of social changes, they feel themselves uninhibited. They are more communicative, more energetic; they are free to do anything" (Transcript 15, personal communication, April 27, 2007). Nine participants discussed the role of the student in today's classroom. Seventy-eight percent viewed students as having a responsibility for their own learning and that learning to be a life long learner was the

primary task of the student. Maria Victorovna, an elementary school teacher discussed this concept.

It's not only my opinion, but the opinion of society, that children should be able to learn on their own, should be independent. There is a saying. The intelligent person is not the one who knows a lot, but the one who knows where to find it. (Transcript 12, personal communication, April 18, 2007)

Thirty-three percent of participants with statements related to the role of the student discussed their experiences with students who have helped the teachers in their learning and use of educational technologies. The role of the student in some cases is expanding to be that of a teacher as well.

Chapter Summary

This chapter provided an exploration of the context in which teachers in the Altai Republic are learning to use educational technology and the impacts of that learning on their worldviews and perspectives related to education. The use of King's Journey of Transformation framework revealed that teachers who have begun to use educational technology are using it to support and supplement their teaching and are integrating its use into their classroom practice. There was only one example of transformation of school curricula as a result of the integration of educational technology. King's framework also revealed that there are multiple levels of support for teachers engaged in this form of professional development, including formal programs provided by the Ministry of Education and the schools. Informal support is an important element in teachers' professional development, as is administrative support. The formal and informal support available to teachers is in alignment with adult learning principles. Time for integrating new skills and knowledge into practice is hampered by limited access to computers and the Internet. A collaborative approach to learning and using educational technology is emerging and is facilitated by past collaborative practice on other issues.

Data collected in this study was also analyzed using Mezirow's transformative learning theory. Statements were coded for each of the ten stages of the theory, but the number and percentage of statements varied greatly. The necessity of computers in modern life and changing expectations of teachers were identified as possible events that

may serve as triggers for transformative learning processes. There were a limited number of participant statements coded for stages related to self-exploration, questioning of assumptions, recognition of shared experiences, building competence and self-confidence, and reintegration into a new perspective. There were a high number of participant statements coded for stages related to exploring options, planning a course of action, acquiring new skills, and trying new roles.

Emergent themes related to computers and student learning and changes in the educational system were also discussed. Discussions about computers and student learning were related to student motivation, learning processes, attitude toward teachers, and misuse of computers. Changes in the educational system were identified as changes in the purpose of education, the role of teachers, and the role of students.

CHAPTER 5 - DISCUSSION AND CONCLUSION

This chapter summarizes the findings of the research as they relate to the three research questions posed by the study:

- 1) Are the methods used by the Center for the Evaluation of Education/Institute for Teacher Training (CEE/ITT) program to train school teachers in the use of educational technology facilitative of transformational learning?
- 2) What, if any, perspective transformations occur in school teachers when they engage in professional development focused on educational technology and how are these changes manifested in classroom practice and educational philosophy?
- 3) What is the role of teacher-to-teacher knowledge transfer in facilitating any perspective transformations among teachers?

This chapter also explores the utility of the selected theoretical frameworks used in the study's design, instrumentation, data collection and analysis: Mezirow's Transformative Learning Theory (1991) and King's Journey of Transformation (2002). It concludes with a section on implications for further research and details plans for future research on transformative learning in the Altai Republic.

Question One

This study sought to discover whether or not the methods used by the CEE/ITT program to train school teachers in the use of educational technology are facilitative of transformational learning. According to King (2002) there are three critical factors that need to be present in order for professional development centered around educational technology to be facilitative of perspective transformation: training and support (in emotional, technical, and instructional arenas), time to commit to learning and integrating new knowledge and skills into practice, and a collaborative approach to developing new curricula and utilizing newly acquired skills. During the process of data collection, it became evident that the CEE/ITT program is one facet of the system to train teachers in

the use of educational technology and that the original question should have been much broader.

Training and Support

In the Altai Republic, there is a multi-layered system which provides teachers with training and support for learning to integrate educational technology into classroom practice. CEE/ITT offers free training for teachers on a variety of topics and in a variety of locations. Courses are a mix of practical experience and lecture, discussion and field trips/observational experiences. CEE/ITT staff report that during workshops they are able to break through the psychological barriers that many people have toward working with computers. Observations of workshop sessions indicated that participants were highly engaged and motivated to learn.

Many schools also provide training for teachers. Some participants reported that schools are now required to provide training for teachers in basic computer skills, although not all of them are in compliance with this directive. A few schools in this study have gone beyond the minimal requirements and provide training to teachers at the intermediate level. The schools play an important role in the process of teachers adopting the use of educational technologies. This is the setting in which basic computer skills can be gained and where the learning of intermediate skills can be reinforced through additional training, one-on-one consultations, and practical experience. Schools function as motivators for learning new skills through changing expectations of teachers and/or through support of school administrators and modeling by other teachers. Teachers working at schools with strong administrative support for learning and integrating educational technology find themselves in highly positive environments where learning and implementing new skills and teaching approaches is being encouraged and facilitated.

The trainings offered through CEE/ITT and in schools appear to have been developed and implemented in accordance with adult education principles and practices as defined by Western researchers and theorists (Brookfield, 1986; Knowles, 1980; Lindeman, 1926). Teachers of other teachers recognize that adult learners require a

practical, hands-on and need-based approach to their learning. Learning activities are focused on what skills are needed and are tied to their work as teachers.

Time to Commit to Learning and Integrating New Skills and Knowledge

King's (2002) second critical factor for facilitating perspective transformation among teachers learning to use educational technologies is time to commit to learning and to integrating new skills and knowledge into practice. Opportunities for learning to use and integrate educational technologies are available both in rural areas and in the capital city. Seventy-eight percent of the teachers in this study participated in training opportunities. Still, time issues were cited by 40 percent of teachers as a challenge to learning and adopting educational technology. The use of release time or a policy of increased pay/incentives for teachers who are engaged in the integration of educational technologies in classroom practice should be explored. Solicitation of input from teachers on how to solve this issue should also be considered.

Access to computer technology is also a challenge for many teachers and was cited as a barrier to learning and using educational technology. Although the number of computers available in schools has increased in the past few years, it is not enough to meet the demand for usage by teachers in any area (preparation, supplementing course material, classroom use). Some schools allocate teachers' computer use according to a timetable or schedule to ensure equal access. Still, in order to use computers in teaching, many teachers must relocate their students to the computer lab. The lack of access to computers for continued learning and utilization of learned skills is detrimental to the knowledge that teachers gain from their time spent in trainings and is likely slowing down any transformative processes which may be occurring among teachers. The Ministry is addressing the lack of computers in schools through grant programs to provide educational resources to schools and schools can allocate these resources according to their own priorities. Recall the case of Olga Borisovna's school, who spent 70 percent of their one million ruble (\approx \$37,000) grant on traditional materials and 30 percent on computer resources. Having the freedom to allocate their resources according to their own priorities led Olga Borisovna to question her previously held assumption

about the types of resources and materials her school needed. Her future plans include completely computerizing the school with additional grant funds.

Collaborative Approaches

King's (2002) third critical factor for facilitating perspective transformation among teachers learning to use educational technologies is a collaborative approach to developing new curricula and utilizing newly acquired skills. Within the confines of this study, collaboration among teachers is occurring, but is largely limited to learning and utilizing new skills, not in the area of developing new curricula. This is likely a reflection of where these teachers are in the process of learning to use educational technology according to King's Journey of Transformation (2002). Eighty-six percent of the teachers reported using educational technology to support and supplement their existing curriculums, while 81 percent have begun to integrate it into classroom practice. Given how teachers are using educational technology, the areas in which they are collaborating in its use is not surprising. Teachers and schools have developed mechanisms whereby collaborative processes can occur. Training sessions within schools are provided for groups of teachers and this study's participants discussed incidents of getting and receiving help from colleagues within the school. The issue and importance of teacher collaboration will be further discussed below in the section Question Three.

Question One Summation

The methods used in the Altai Republic to train school teachers in the use of educational technology have great potential to be facilitative of transformational learning. With respect to issues of support and training, a multi-level, interlocking system has been established within the Altai Republic. This training is in line with accepted adult education practices and principles. It is unknown by this researcher exactly how many teachers and schools are a part of this system, but the mechanism itself is a solid approach to providing support and training to those participating. Time to devote to learning and in particular access to computers is an area in which improvement is needed. Many teachers in this study reported issues with time and access to computers as a barrier to their use of educational technologies in their profession. This is a weakness in the CEE/ITT program's ability to be facilitative of transformational learning. Improvements

in this area will not only enhance the possibilities for transformative learning, but accelerate the adoption of educational technologies in the classroom by a larger number of teachers. The capacity for collaboration within schools exists and is currently occurring among teachers who are learning to use educational technology. As teachers move farther along in the process of learning to use educational technology and begin to develop new curricula, it is likely that they will continue the collaborative processes in which they are currently engaged.

Question Two

The second research question posed by this study is what, if any, perspective transformations occur in school teachers when they engage in professional development focused on educational technology and how are these changes manifested in classroom practice and educational philosophy? In order to answer this question, we must examine specifically how teachers are thinking differently and acting differently.

New Thinking

Teachers are thinking in many different ways based on their experiences with learning to integrate educational technology into the classroom. Most teachers participating in this study think that computers and the skills to use them are a necessary element of the teaching profession. Some teachers think that they can teach more effectively with computers and that students are more motivated learners when educational technology is utilized. Some teachers think that they can give more individualized attention to students with the help of educational technology. Some teachers also think that teachers who use computers gain a higher degree of respect from their students than teachers who don't use educational technology in their teaching. While not explicitly stated, teachers are changing their expectations of students as well: Students are expected to utilize educational technology more and more as part of their classroom activities (making presentations, finding information, etc.). Some teachers think that the complete computerization of the school is essential.

New Actions

Teachers are also acting in different ways based on their experiences in learning educational technologies. They are actively engaging in learning about educational technologies and their uses in a variety of ways, including formal training and workshops, informal consultations with colleagues, and self-directed learning. They are also learning through the practical application of their new knowledge in their teaching. Teachers are using educational technology to locate new content and methods for their courses, sometimes from newly discovered or previously inaccessible sources. They use educational technology in preparing materials, assessing student achievement, presenting content, and for demonstrations and experiments. They are adding multimedia elements (sounds, images) to their teaching environments and giving assignments to students that include the use of educational technology. Teachers (and administrators) are developing programs to expand their own or their school's capacity to integrate technology into the educational process. They are exploring new roles for themselves and new ways of relating to their students.

Perspective Transformation

According to King's Journey of Transformation (2002), the teachers in this study are two-thirds of the way to perspective transformation based on how they are using educational technologies. The study uncovered many examples of technology use by teachers in the first two stages of the process (support/supplement and integration into existing curricula), but only one example of the third and final stage, transformation of curricula. The use of educational technology by this study's participants is basically geared toward traditional methods of instruction—sharing information with students and making assessments about students' knowledge gain. However, teachers reported high levels of use in student work, which may be evidence that students are being required to find information on their own and share it with others, indicating a move from the traditional banking method of teaching (Freire, 1970) toward a student centered and more democratic learning environment. If this is the case, then perhaps the process of transforming curricula has been initiated.

Changes in Meaning Schemes and Perspectives

Based on their uses of educational technology, most participants in this study have not completed a transformational process as identified by King (2002). In addition to King, a perspective transformation framework by Mezirow (1991) was used to analyze the experiences of the study's participants. According to Mezirow (1994), there are four ways in which adults can learn or in which perspective transformation occurs: "by refining or elaborating our meaning schemes, learning new meaning schemes, transforming meaning schemes, and transforming meaning perspectives" (p. 224). Meaning perspectives are sets of codes (sociolinguistic or sociocultural, psychological, or epistemic) that shape our perceptions, feelings, and cognition. Examples of one's meaning perspective include social norms, ideologies, personality traits or learning styles (Mezirow, 1994). Meaning schemes are the concrete expressions of our meaning perspectives. Meaning schemes shape our perceptions or definitions of a particular event, concept or experience. Perspective transformations can be the result of a major life event (a change in meaning perspective) or the result of several incremental and accumulative events (several changes in meaning schemes).

It is likely that the participants in this study are experiencing perspective transformation with regards to learning educational technology as a series of several changes to their meaning schemes. This is due to several factors. The computerization of schools in the Altai Republic has been a slow process. The federal program to computerize the schools was established in 2000. The program was not initiated in the Altai Republic until 2004. Although all schools are now equipped with computer laboratories, the number of computers available to teachers is still very low. Internet access is still minimal. At the schools participating in this study, generally only 10 to 20 percent of teachers had begun learning and using educational technologies. Although progress toward developing technological infrastructure is being made, the process is still slow and has been slow enough that it's not a sudden or unexpected event in the life of any educator. The above review of the new thinking and actions of teachers participating in this study show a process that is composed of several incremental and accumulative events. Even the dramatic perspective transformation experienced by Olga Borisovna can be viewed as an incremental and accumulative process. Olga Borisovna is the principal

and history teacher whose school won a one million ruble grant, 30 percent of which was spent on computer equipment. As a result of experiencing the impact of additional computer technology in the school, coupled with Internet access, Olga Borisovna questioned her assumptions about the role of technology in education and she now thinks that computerizing the entire school is necessary and has the goal of obtaining more grant funding to accomplish that task. This perspective transformation was the result of her experiences and her own meaning making activities during her school's progression toward computerization.

Question Three

The third question posed by this study focused on the role of teacher-to-teacher knowledge transfer in facilitating perspective transformations among teachers. Teachers play a large role in other teachers' learning educational technology. Informatics teachers in schools are commonly viewed as local experts and guides in the use of computers by other teachers. Seventy percent of teachers discussed giving help to and receiving help from other teachers, indicating that teacher-to-teacher knowledge transfer occurs in this setting. Teacher-to-teacher knowledge transfer happens in formal settings, such as training sessions offered by informatics teachers to their colleagues. Informal assistance also plays an important role in schools. One-on-one assistance to acquire knowledge is another strategy used by teachers. Twenty-four percent of participants discussed informal learning from their colleagues as a method of learning more about educational technologies. Non-informatics teachers are also becoming providers of technical assistance and are sharing their knowledge about educational technologies with other teachers. This is a phenomenon that is supportive of transformational learning as this activity provides a space where teachers can experiment with new roles (stages 5 and 8) and gain confidence in their new abilities (stage 9).

Teacher-to-teacher knowledge transfer also may be further facilitative of transformative learning by providing a context in which teachers can recognize that one's discontent and the process of transformation are shared and that others have negotiated a similar change (stage 4). This is a stage in which very little evidence was collected during the course of this study, which may have been because of the highly personal and internal

nature of this stage of the process of transformation. This may have been due to many factors, including lack of awareness of experiencing this stage or perspective transformation in general (Mezirow, 1990), lack of trust/bond with the researcher, and cultural norms (private versus public dialog and space). Based on many of the statements made regarding the necessity of computers and the changing expectations of teachers, teachers may feel that they have no choice about adopting the use of educational technology in their teaching. Such a situation may make the need for self-examination in this context irrelevant and unnecessary. A closer examination and exploration of non-informatics teachers' experiences in providing assistance to other teachers may be a pathway toward uncovering how this stage of perspective transformation is operationalized in this specific setting, particularly as non-informatics teachers continue to grow in their experience and knowledge in educational technology.

One of the schools participating in this study provided an example of how teacher-to-teacher knowledge transfer could be utilized both for increasing the skill level of teachers in using educational technology and for facilitating perspective transformation. At this particular school the informatics instructor, Yuri Ivanovich, blended a traditional method of teachers' professional development with his plans of teaching his colleagues intermediate skills in educational technology. Yuri Ivanovich constructed his intermediate level informatics training as a creative group, which is a commonly used practice in which teachers teach other teachers in order to help with professional development. Under Yuri Ivanovich's plan, the teachers in his school would learn how to use educational technology in project based learning. At the same time, they would put these skills into practice by working with a selected group of students on a project. Such an approach (or a modified version) could be facilitative of transformative learning. If the creative group focused on curriculum development using educational technology, it could help launch teachers into the third stage of King's uses of educational technology framework (2002). Working on creating new curriculum with the aid of educational technology could also provide a space in which teachers can begin to make critical assessments about their assumptions (Mezirow stage 3), provide a mechanism for recognizing shared experiences (Mezirow stage 4), as well as leading teachers toward the subsequent stages of perspective transformation.

Utility of Selected Theoretical Frameworks

This study used transformative learning as the theoretical framework for defining the research questions, designing the study, and analyzing the data collected. The works of two transformative learning theorists were drawn upon: Mezirow, the original developer of transformative learning theory, and King, who works in the area of professional development for teachers in the area of educational technology. In addition to the stated research questions, this study also explored the relevance and applicability of using frameworks developed in a largely democratic context in a setting such as the Altai Republic.

The frameworks of Mezirow and King were useful and appropriate tools for exploring the transformative potential of professional development for teachers in the Altai Republic in the area of educational technology. Instrumentation developed using these frameworks enabled the researcher to adequately address the research questions. King's *Journey of Transformation* (2002) was particularly useful in examining the transformative potential of programs being utilized in the Altai Republic to train teachers in the use of educational technology. It was also effective in establishing how teachers are using educational technology and what this reveals about their progress toward perspective transformation. King's framework was used to create a picture of the setting and context in which teachers in the Altai Republic are learning and using educational technology. Mezirow's framework was used to explore the specific experiences of teachers as they were engaging in learning to integrate educational technology into their classrooms and the meanings those experiences have in terms of perspective transformation.

There were two emergent themes in the data: computers and student learning and changes in the educational system. With respect to the theme of computers and student learning, statements were grouped into four main categories: student motivation, learning processes, attitude toward teachers, and misuse of computers. Statements made about changes in the educational system were related to the purpose of education, the role of teachers, and the role of students. During the analysis of the data, statements related to these themes were not coded within the frameworks of King or Mezirow. This may be due to the frameworks being focused on the experiences of the individuals being

examined and on individual change. While the experiences of students are related to teachers' perspective transformation, statements about students' use of computers did not fit neatly within the categories of analysis proscribed by the King and Mezirow frameworks. Changes in the educational system are related to institutional and systemic change, which are not the types of changes generally analyzed using the frameworks associated with transformative learning theory.

Cultural Differences

Mezirow (1991) delineated a ten stage process of perspective transformation. Statements made by the teachers in this study were coded for each of Mezirow's stages to varying degrees. Figure 5-1 below shows the percentages of participants with statements coded for each stage of TLT. TLT is not a linear process, so it is not expected that the lower percentages at earlier stages followed by higher percentages at following stages is an indication that the framework is not an appropriate tool for examining perspective transformation in this context. Rather it likely points to the cultural differences between the research setting and previous applications of TLT.

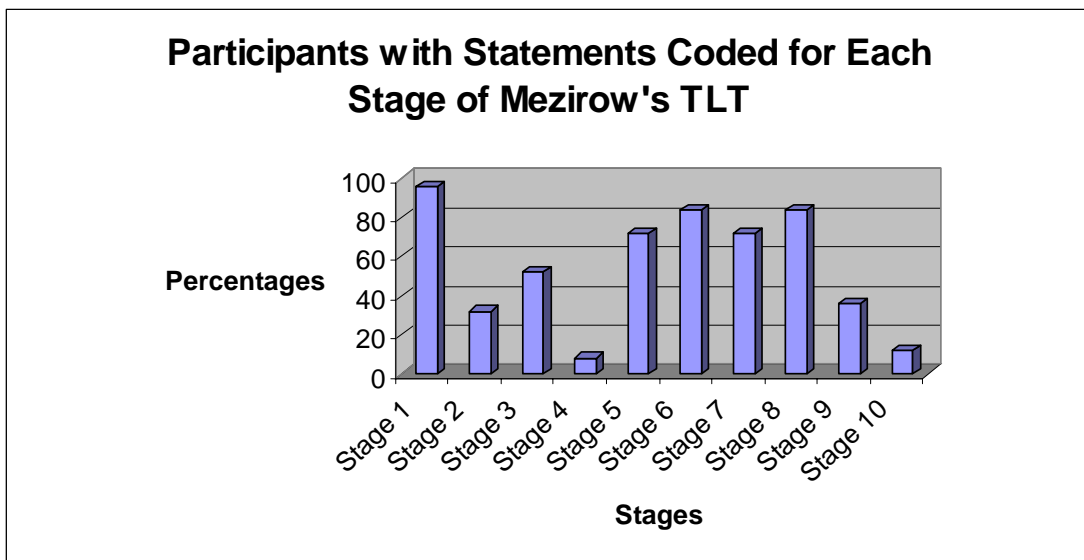


Figure 5-1. Percentage of participants with statements coded for each stage of Mezirow's TLT.

Stages four and ten have the lowest percentages of participant statements, followed by stages two, nine, and three, respectively. Stage ten is characterized by reintegrating past perspectives with newly acquired ones. It may not be surprising that

few participants in this study provided evidence of such occurrences given the short amount of time in which educational technology has been available in the Altai Republic. It is possible that the explanation for low percentages in the remaining stages (two, three, four, and nine) lies in cultural differences between the context of the research and the theoretical underpinnings of the frameworks. Transformative learning theory is essentially a theory about how adults change their world views and perspectives. It was developed in the West and has largely been researched and applied in democratic contexts. Applying it in a post-totalitarian context, such as the Altai Republic, creates the opportunity for exploring the cultural assumptions inherent in the theory. Attitudes toward change are one of the biggest differences between American and Russian cultures. Americans are sometimes resistant to change and even welcome or anticipated changes are sometimes stressful, particularly changes related to identity and self-concept. Russian culture has a different attitude toward change, as perceived and understood by this researcher, who over eight years has spent the sum total of one year in this context. In the Altai Republic, people have a much greater ease with change, both with regard to the natural courses of human life and with directives handed down from a centralized authority. That change occurs is expected and natural. It is unclear exactly how this impact is shaping the process of transformative learning or how the process may differ when an individual experiences different types of changes, such as normal life changes (births, deaths, etc.) Further research is needed to uncover how different types of changes (natural and directed by authority) affect the processes of transformative learning in this setting.

Transitions are celebrated much more in this context than in the U.S., even in educational settings. In the U.S., we celebrate graduations, as is the tradition in Russia. But in Russia the beginning of the school year is celebrated just as much as the end. There are also many celebrations of change and transition throughout the academic year. In university settings, there is a celebration and ceremony for first year students when they receive their record books (students are responsible for keeping their transcripts and records). There is also a celebration for fifth year students when they have finished their coursework and begin working on their senior projects.

Related to attitudes toward change are attitudes and perceptions about control. One of the basic American values is that individuals are in control of their own destinies and are responsible for the outcomes of their actions. This is another difference between Russian and American cultures. Russian culture has a tendency toward fatalism and destiny in which the notion that things just happen and are beyond the control of individuals is an accepted truth.

In a context in which these beliefs and attitudes are prevalent, it should come as no surprise that change will be experienced differently than in a context such as the U.S. In such a context is a disorienting dilemma all that disorienting? If fate controls one's destiny, would guilt and shame accompany self-exploration? What is the motivation for self-exploration? In this context, what factors and events would stimulate the questioning of assumptions? In order to understand how people in the Altai Republic experience transformative learning, one must understand how they experience and perceive change. These are highly internal processes of an intensely personal nature. The methodology used in this project was unable to uncover these processes. Collaboration with local researchers and specialists is needed to devise appropriate strategies for examining these phenomena in this context.

Alignment of Mezirow and King Frameworks

Mezirow's (1991) ten stage process of transformative learning was used to analyze the experiences of teachers as they learn to integrate educational technologies into classroom practice. King (2002) provides an alignment of her four stage journey of transformation, which she developed following years of working with teachers engaged in learning to use educational technologies in the U.S. When King's framework was used to view the data collected from participants with respect to stages of transformative learning a pattern emerges which differs in significant ways from the analysis using Mezirow's framework. Figure 5-2 shows a comparison of King's and Mezirow's stages in terms of statements coded from participants.

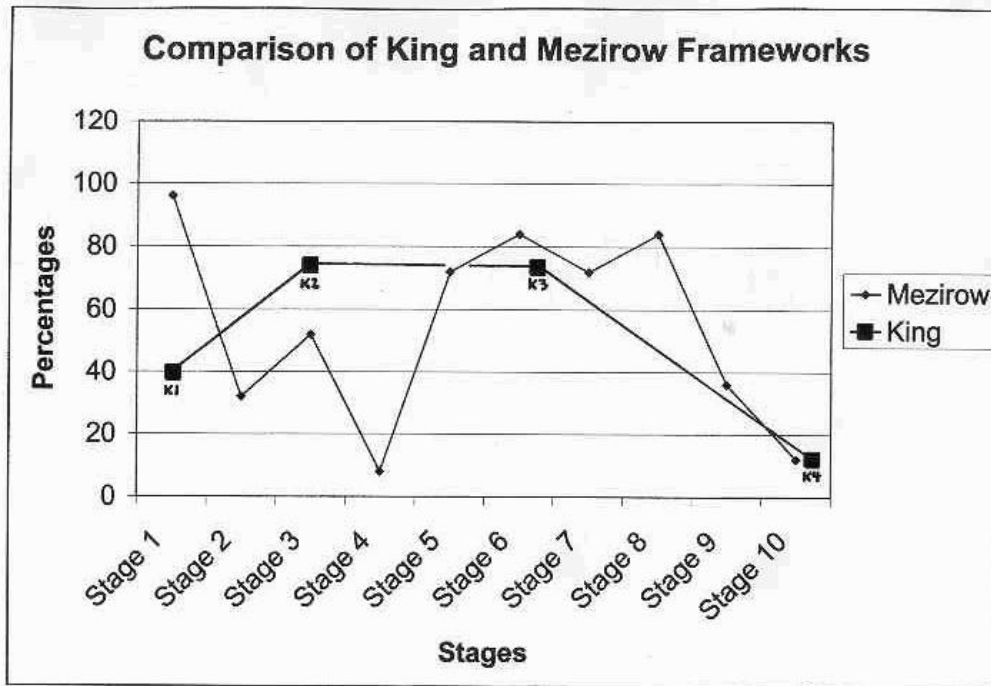


Figure 5-2. Comparison of King and Mezirow’s frameworks using data from this study.

The first stage of King’s framework is fear and uncertainty, which she aligns with the first two stages of Mezirow’s framework, disorienting dilemma and self-exploration with shame and guilt. Using King’s framework a lesser percentage of participant statements are coded for stage one. The use of King’s framework alone would have masked the contextual findings of changing expectations for teachers and the necessity of computers as factors contributing to a disorienting dilemma.

King’s second stage, testing and exploring, is aligned with stages three, four and five of Mezirow’s framework (assessing assumptions, recognition of shared experience and exploration of options). The use of King’s framework alone would have masked the highly varied percentages revealed by Mezirow’s framework and may have effectively hidden the cultural differences which need to be more fully explored in future research.

King’s third stage, affirming and connecting, is aligned with stages six, seven, eight, and nine of Mezirow’s framework (planning a course of action, acquisition of knowledge and skills, provisional trying of new roles, and building of competence and self-confidence). The use of King’s framework mirrored the findings of Mezirow’s with regard to stages six, seven and eight. Using it alone would have masked the lesser

percentage of statements coded at stage nine, which is another potential cultural difference.

King's fourth stage, new perspective, is aligned with stage ten of Mezirow's framework (a reintegration into one's life on the basis of conditions dictated by one's new perspective). The use of King's framework mirrored the findings of Mezirow's with respect to this stage.

Potential for Broader Transformation

The changes occurring in schools in the Altai Republic may be providing the groundwork for broader transformations of the educational system. Russia's educational system is in transition from a banking method of teaching to one that is becoming more democratic and learner-centered. The continued use of educational technology in this context may be ultimately transformational with respect to the curricula taught in schools. As the analysis of teachers' use of educational technology and the critical factors for transformation identified by King (2002) indicate, teachers' use of educational technology indicates that some teachers are on the path toward transformation. The mechanism being used to develop teachers' capacity to utilize educational technology has potential for facilitating transformation. It is likely the curricula of schools will continue to evolve toward education that focuses on developing learners' skills in finding and utilizing information and on developing independent thinkers, which is the path the Ministry of Education has established.

Increased use of educational technologies brings the potential for new information and new sources of information to be utilized and incorporated into the curricula. This infusion of new sources and information can itself be facilitative of perspective transformation. According to Mezirow (1989), if a person has experienced transformative learning, they should possess a superior perspective, which

is more inclusive, discriminating and integrative of experience; is based on fuller information; is freer from coercion or distorting self-deception; more open to other perspectives and points of view; more accepting of others as equal participants in discourse; more rational in assessing contending arguments and evidence; more critically reflective and more willing to accept an informed and

rational consensus as the authority for adjudicating conflicting validity claims.
(Mezirow, 1989, p. 171)

Utilizing new information and sources of information can help both teachers and students develop fuller, superior perspectives by introducing them to new ideas, new peoples and helping them to connect with the experiences of others around the world. It can help provide them with experiences that may serve as disorienting dilemmas, lead them to self-exploration, questioning of assumptions and recognition of shared experiences.

Implications for Further Research

Additional research on the relevance of TLT in this setting is warranted based on the findings of this study. In order to advance research on transformative learning theory in the Altai Republic, collaboration with and the involvement of local researchers and specialists is required. Given the large role that language and culture play in meaning making (and meaning making is the heart of perspective transformation processes), broader and deeper collaboration with linguists is warranted in future research. Researchers from fields such as education, psychology, and sociology should also be involved in future research efforts. Contextual and cultural corollaries need to be found for the stages and principal tenets of TLT, which could be used to inform future research methods and instruments. Methods and instruments developed with the help of local specialists would be more appropriate and effective in this setting. The involvement of linguists in analysis of qualitative data would also provide a pathway for deeper analysis of participant experiences.

The TLT stages for which evidence was lacking in this study included stage 2, self-examination with feelings of shame or guilt; stage 3, critical assessment of assumptions; stage 4, recognition of shared experiences; and stage 9, building of competence and self-confidence. These are largely internal processes and statements related to them were difficult to elicit from participants. The involvement of local specialists in developing research protocols will be useful in finding out the linguistically and culturally correct ways of elucidating how these and other TLT stages are operationalized in this particular setting.

One different research method that may be helpful in this setting (and to TLT research in general) is that of collaborative analysis. Collaborative analysis involves research participants in verifying the researcher's interpretations of the participants' experiences and seeks to engage them in analysis of the data. Ross (2005) used this method in a research project related to teachers' development of voice in educational policy. According to Ross, "many participants reported that the (follow-up) interviews and the interactions with the data were 'enlightening', 'enjoyable', 'validating' and 'reflective' experiences for them" (2005, pp. 71-2). Use of such a technique in research on transformative learning may help researchers to understand the meaning of transformations to those who are experiencing perspective transformation. Perspective transformation is about making meaning and what better way to understand the process of someone else's meaning making than to engage them in an analysis of that process?

Attention also needs to be paid to the cultural differences within the Republic itself. The Altai Republic is the homeland of the Altaian people. This indigenous population makes up 30 percent of the Republic and resides primarily in the southern part of the Republic. Further research in this context gives the possibility of examining the mechanisms of perspective transformation among this culture. This study was unable to include these perspectives due to logistical and financial constraints. This study was limited geographically to the northern portion of the Republic. The bulk of the Altaian population is located in the southern portion of the Republic and in some of these areas special government permission is required to visit these locations.

Future Research Projects

There are several potential project opportunities that will enable additional research on transformative learning theory to be conducted in this setting.

Further Work with Teachers

The computerization of schools in the Altai Republic is in its very early stages. In order to fully understand the transformative implications of this process (with respect to teachers, schools, and the educational system), continued study is warranted. During the course of the research study, it became apparent that many teachers and administrators are interested in interacting with their peer schools in other countries. There is a desire to

use educational technology as a vehicle for school exchanges and such a project provides opportunities for teachers to continue the journey of transformation. Many teachers who participated in this study have begun using educational technology to support and supplement their teaching and are integrating it into their classrooms. The next step for them to take, according to King (2002), is to begin using educational technology in developing new curricula. Incorporating these elements (educational technology, student/teacher international exchange, and curriculum development) provides not only a vehicle for facilitating continued transformation, but a well defined context in which to document that process. Such a project could make good use of the collaborative analysis methodology discussed above. Building upon the relationships and connections established throughout this project, work will continue with teachers and schools to develop international exchange opportunities.

Perspective Transformation and Life History

In addition to continuing to explore the transformative potential of teachers' learning to use educational technologies, our understanding of perspective transformation in the Altai Republic would benefit from a broader exploration of transformative learning in this context. Life history methodology (Seidman, 1998) could be used to explore the experiences of a wider range of people in the Altai Republic with respect to the social, economic and political changes they have experienced in their lives. This type of project would allow for an exploration of changes in meaning perspectives and schemes involving psychological, social-cultural, and epistemological areas, which is significantly broader than this study's focus. This project could also provide an examination of experiences of perspective transformation with respect to gender, class, and ethnicity.

University Students and Perspective Transformation

English language students at Gorno-Altai State University (GASU) will participate in a women's studies course in spring 2008. Students will explore American women's issues in comparison with women in Russia and the Altai Republic, with a focus on gender, race, and class. The course will emphasize the role of women in improving the status of women in society. The course will also model the processes/instructional practices common to women's studies: group discussion,

exploration of self in relation to society, critical thinking skills, consensus building. The course will also introduce students to on-line/distance education programs and build their skills in using computer technology.

This will be both the first women's studies course and distance education course offered at GASU. Quantitative and qualitative methods will be used to explore the transformative experiences of students in this course. King (1996) developed a survey instrument to measure transformative learning experiences among adult learners. A modified version of this instrument will be used in conjunction with an analysis of student work produced throughout the course. This will allow the researcher to explore the impact of the course on students and to examine the utility of women's studies courses in the development of democratic perspectives in post-totalitarian settings.

Chapter Summary

This study addressed three research questions focused on professional development experiences for teachers in the Altai Republic, Russian Federation. In this setting, teachers are beginning to learn how to integrate educational technologies into their classroom practices. This study explored the potential for transformative learning associated with this type of learning and experience. Findings indicated that the methods used to train teachers have a high likelihood of being facilitative of transformative learning. It also found that teachers are beginning to think and act in new ways based on their experiences with educational technology. Teachers are also collaborating in this learning process, which provides an important support for continued learning and growth.

This study also explored the applicability of using western developed theoretical frameworks for analyzing transformative learning in this context. Findings indicate that the frameworks were useful tools for exploring transformative learning in this setting and helped to uncover the elements of transformative learning which are culturally determined. Further research is needed to further our understanding of how transformation occurs and is experienced in this setting. Collaboration with local experts and researchers is necessary to uncover the cultural differences related to perspective change.

Many future pathways are available for continuing to explore transformative learning in this context. They include continued work with teachers, a general exploration of transformative learning, and work with university students.

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Appendix A - Questions for Teachers

Background Information

1. How long have you been a teacher? Why did you become a teacher? Where did you study?
2. Where were you born, raised?

Experiences with Learning Computers

3. Why did you become involved in learning computers? How long have you been working at it?
4. Describe your process of learning computers. Did you participate in training? Do you participate in a learning group?
5. How have other teachers helped you learn to use computers? Example?
6. What do you have in common with other teachers here who are learning computers? How did you come to realize this commonality?
7. Have you ever needed help in preparing for using computers in your teaching?
8. How could the process of learning computers be improved?
9. How does the school's administration support your learning of computer skills and the use of computers in teaching? How did you make time to learn these skills?
10. How did you feel when going through the process of learning computers? What were your reactions? Was it exciting, did you have doubts, fears?

Teaching Experiences

11. How have your experiences with computers changed what you do in the classroom? With regards to instructional methods? Curriculum? Testing?
12. Have computers affected relationships between teachers? Between students? Between teachers and students? What are the relationships like before?
13. Have your experiences with computers affected your attitude toward teaching? How have your attitudes about teaching changed throughout your career?
14. How is education/school different today than when you were a student or how has it changed throughout your career?

15. What are your teaching goals? How can computers help you reach these goals?
16. What does educational technology bring to the classroom?
17. What benefits have you seen from computers to the school? Community?
Students? Other teachers? Yourself?
18. What plans do you have for further learning involving computers and computer resources?
19. Is there anything else that could help you become a more effective teacher?
20. What do you think are some of the current problems in the educational system?
Who is responsible for solving them? What is your role in solving them?

Attitudes about Education

21. Currently, what do you think the purpose of education is? What is the role of the teacher? How has this changed during your career? Can you attribute any of these changes to your computer learning?
22. How will technology change the educational system in the Altai Republic? How might classroom practice be different? How might the goals of education change?
23. What are the skills and concepts that your students need to learn in school? How have your beliefs about this changed during your teaching career?
24. What are the roles of teachers in your community? What are the responsibilities? How have your beliefs about this changed during your teaching career?
25. Have you ever experienced a conflict in your beliefs or knowledge about education or teaching? How did you resolve this conflict.
26. Where do you think knowledge comes from? Who creates knowledge?

Appendix B - CEE/ITT Program Staff Questions

Program Details

1. Describe your program to teach educational technology to school teachers.
2. How was the model for this program chosen? Was utilizing specialists in instructional technology considered or discussed?
3. Describe the workshop agenda for training teachers in the use of educational technology in the classroom. How many hours did it last, what activities did they participate in? What topics were covered? How are computers used?
4. How would you describe the learning environment/atmosphere in your training/programs?
5. Describe how the teacher learning groups function.
6. What guidance do you give program participants in transferring knowledge to their peers?
7. Why did you choose to utilize teacher-to teacher knowledge transfer as part of your program?
8. What outcomes have you seen from this aspect of your program?
9. What benefits have you seen from this project to the schools? Community? Students?
10. How could this program be improved?
11. What future directions will your program take?

Information about Participants

12. Why do your participants choose to learn about computers? What motivates them to engage in this type of learning, skill building?
13. What changes/impacts have you seen in the teachers who participate in your programs? Confidence/comfort in using computers, approaches/attitudes toward the use of computers in class, overall attitude?
14. How does the schools' administration support teachers' acquisition of computer skills and the use of computers in teaching?

Beliefs about the Education System

15. How is the education system in the Altai Republic organized/structured? Who decides what curricula to teach?
16. What is the role of teachers in the Altai Republic?
17. What is the purpose of education?
18. What are the skills and concepts that students need to learn in school?
19. How is education/school different today than when you were a student?
20. How will technology change the educational system in the Altai Republic? How might classroom practice be different? How might the goals of education change?

Appendix C - Informed Consent Statement (English Translation)

A. General Information

1. Name of Researcher: Jacqueline Spears, Ph.D., Department of Secondary Education, Kansas State University

2. Title of Study: Adult Education in the Altai Republic, Russian Federation

3. Objectives of Study: To document the providers of adult education in the Altai Republic.

4. Description and purpose of procedures: This part of the research consists of interviews with providers of adult education in the Altai Republic, Russian Federation. This interview will last approximately one to two hours and will include questions about your activities and experiences as a provider of adult educational activities. These interviews will be tape recorded and later transcribed. This information will be used to document the providers of adult education in the Altai Republic.

5. Use of results: Data collected in this project will be used in published reports of the research in professional journals.

6. The risks and discomforts are minimal. They may include: Strictly the use of your time is required. No physical risk is involved, and your behavior or responses will not be manipulated in any way.

7. Possible benefits to you or to others from participating in this study: Interview subjects in this type of research typically report some subjective benefit from being able to express their opinions on matters of concern to them. The information you provide may also be helpful in the ongoing process of developing and delivering adult educational activities.

Your participation is completely voluntary and you may refuse participation at any time without penalty or prejudice. All research information will be handled in the strictest confidence and your participation will not be individually identifiable in any reports. I will be happy to answer any questions you have about the above items. If you have

questions about the research that arise after this interview, please feel free to contact me at (785) 843-3659. Questions about the role of the university or your rights as a participant in this research should be directed to Rick Sheidt, Chair, Institutional Review Board, Kansas State University, (785) 532-3224.

B. Signed Consent Portion – to be retained by respondent

I understand the study entitled: “Adult education in the Altai Republic, Russian Federation” as explained to me on page 1 and I consent to participate in the study. My participation is completely voluntary. I understand that all research information will be handled in the strictest confidence and that my participation will not be individually identifiable in any reports. I understand that there is no penalty or prejudice of any kind for withdrawing or not participating in the study.

(Respondent Signature)

(Date)

(Researcher signature)

(Date)

B. Signed Consent Portion – to be retained by researcher

I understand the study entitled: “Adult education in the Altai Republic, Russian Federation” as explained to me on page 1 and I consent to participate in the study. My participation is completely voluntary. I understand that all research information will be handled in the strictest confidence and that my participation will not be individually identifiable in any reports. I understand that there is no penalty or prejudice of any kind for withdrawing or not participating in the study.

(Respondent Signature)

(Date)