Master of Science in Education: Educational Technology Basic Program Information

- 1. Proposing institution: University of Kansas School of Education
- 2. *Title of proposed program*: Educational Technology
- 3. Degree to be offered: Master of Science in Education: Educational Technology
- 4. Anticipated date of implementation: Fall 2009
- 5. Responsible department: Educational Leadership and Policy Studies
- 6. Center for education statistics code: 13.0501

Program Proposal Narrative

A. Program Need and Student Characteristics.

1) Overview the Program and Relation to the KU School of Education Mission

The proposed Master of Science in Education (MSEd) degree in Educational Technology degree is designed to address the growing needs for educational technology professionals in industry, government, preK-12 schools, community colleges and higher education. When considering this proposal, it is important to note that the proposed program represents a critical extension of an existing concentration that is currently housed in the Curriculum and Instruction (C&I) MSEd program within the Department of Curriculum and Teaching (C&T). The current concentration in C&I focuses on the integration of educational technology in K-12 schools which was appropriate when educational technology was first introduced in schools 25 years ago. With the rapid growth of educational technology across institutions regionally and worldwide, and with its extension beyond K-12 education into business and industry, it is appropriate now to establish an independent master's degree program in Educational Technology. This proposal requests conversion of the current concentration in Curriculum and Instruction to the status of a separate, independent degree program, which, given its expanded scope, will be located more appropriately in the Department of Educational Leadership and Policy Studies.

The Master of Science in Education (MSEd): Educational Technology program consists of 36 hours of coursework (which includes a practicum), an exam, and the production of a portfolio that collectively reflect the students' competencies in National Educational Technology Standards (NETS). This MSEd degree will support KU's commitment to advance the efficiency and richness of offerings through interdisciplinary programs. The program's three concentrations in the (1) Integration, (2) Design, and (3) Administration of Educational Technology will draw on the diversity of a major research university. The departments of Curriculum & Teaching (C&T), Educational Policy & Leadership Studies (ELPS), Special Education (SPED), Electrical Engineering & Computer Science (EECS), Design, and Communication Studies (COMS) will collaborate to offer coursework. Program graduates will be qualified as leaders in integrating, designing and/or administering educational technology for positions in K-12 schools, higher education, government and industry.

The expanded character of the proposed program warrants its identification as separate and unique degree program, rather than as a concentration embedded within the Curriculum and Instruction program. As an independent program, the MSEd in Educational Technology will allow the faculty to expand the program's target population by incorporating coursework in EECS, COMS, Design, ELPS and SPED and adding concentrations in the Design and Administration of Educational Technology. These new concentrations will broaden the program's appeal for students with career paths in government and industry training as well as educators in K-12 schools, community colleges and universities. Because the program draws on existing resources and personnel, it will be implemented with no additional cost to the State.

The independent program status responds to the need for a unique identification voiced by students who, only after entering the School of Education as graduate students, change their degree focus upon finding that a concentration in Educational Technology is offered. Based on the faculty's experience with these students who change their degree focus upon entering the School of Education, the faculty believe that a more visible, independent and expanded program would strengthen our ability to recruit students. The independent program status will be especially important for recruiting students with career paths in industry and government sectors as the focus within Curriculum and Instruction is often associated exclusively with K-12 education. The proposed program will satisfy the need for increased educational opportunities in the area of technology education, as prioritized by the Johnson County Education and Research Triangle (JCERT). With JCERT support, the offering of this program at the KU Edwards Campus in Overland Park will serve a broader audience.

2) Student Demand

Graduates from the current MSEd in Curriculum and Instruction concentration, particularly those pursuing degrees in higher education or the private sector, have commented that although the academic program prepared them well, they would have benefited in their job search from a program with a more unique identity. The current embedded nature of the focus within Curriculum and Instruction makes the program in educational technology less recognizable for those who are looking for careers in higher education, government and the private sector. Adoption of an independent MSEd degree program in Educational Technology provides more flexibility to draw on expertise from different departments in developing an interdisciplinary approach to the program.

As an embedded concentration within the MSEd in Curriculum and Instruction, the program has averaged 9 new student admissions each year. The increased visibility of an independent program, the interdisciplinary course offerings and the expanded focus in the integration, design and administration of educational technology will significantly benefit the program quality and the program's recruiting prospects. With these improvements, the program faculty expect to at least double the number of student admitted to the MSEd in Educational Technology. Implementation of the program as a part of the Johnson County Education and Research Triangle initiatives will further increase enrollments in the degree program.

3) Demand for Graduates of the Program

The program's concentrations will prepare students for positions that the 2008 Sloan Report [1] shows are in increasingly high demand, partly because of the dramatic 13% annual growth in online course enrollment, that are predicted to continue over the next decade. This section describes how the growing demands for educational technology expertise in education, industry and government will be uniquely addressed in the program's Integration, Design and Administration concentrations.

Demand in the Integration of Educational Technology

Graduates of the Integration concentration will seek jobs with titles such as: online educator, training specialist, curriculum designer and educational technology teacher, and professor. Students in this concentration will learn how to apply existing educational technologies to advance teaching and training. The program will serve K-12 teachers with content area expertise who are looking to extend their knowledge in educational technology and the opportunities they offer students. As Kansas Commissioner of Education, Alexa Posny, recognized, these teachers "are not only increasing students' knowledge of a topic, but they are also assisting young people in developing many of the cognitive or 'soft' skills in critical thinking, problem-solving, organization, and communication necessary for success in the workplace" [2].

A national survey of school district administrators in 2007-08 [3] found that the integration of educational technology in K-12 schools is expanding for both fully online and blended learning (part online and part traditional face-to-face instruction). The overall number of K-12 students engaged in fully online courses in 2007-08, is estimated at over a million with a 47% increase over 2005-06. Will this growth rate continue? One group including a Harvard business professor likens the growth in eLearning to another "disruptive innovation," the transistor, and predicts that by 2019 half of the grades 9-12 courses will be delivered online [4].

In industry, government and education, demand for educational technology expertise is often reflected more in the need to retrain the work force than in new job openings [5,6,7]. For example, as K-12 administrators seek to respond to the growing demands for online and blended eLearning, two of their greatest concerns relate to "course development" and "the need for teacher training" [3]. School administrators and government agencies are encouraging teachers in all content areas to upgrade their ability to integrate educational technology in their teaching and class management [3,7]. In gaining a master's degree, these teachers also will receive a significant advance on the pay scale.

While the economic downturn may result in fewer immediate job postings, a greater percentage of current employees are returning to school to prepare for changing career opportunities. When asked about the potential impact that an economic downturn might have, higher education administrators believed that the downturn would more likely increase than decrease online enrollments [1].

Further demand for the program's graduates will emerge from the new US stimulus plan as the US Department of Education's Enhancing Through Technology (Ed-Tech) program distributes \$650 million. These funds are routed to the states for teacher professional development and will result in new jobs in Educational Technology and the retraining of currently employed personnel [8].

The demand for teacher expertise in educational technology encompasses both urban and rural districts. In a 2008 national survey of school district administrators the researchers reported, "Perhaps the voices heard most clearly in this survey were those of respondents representing small rural school districts. For them, the availability of online learning is a lifeline and enables them to provide students with course choices and in some cases, the basic courses that should be part of every curriculum." Thus, by enhancing teachers' knowledge in the theory of educational technology and application of eLearning, the program faculty increase their capacity to reach students in all regions. As earlier studies have reported, the rural Midwest region has some of the greatest demand for teachers with expertise in education technology [6].

Demand for the Design of Educational Technology

The program's Design concentration will address the rapidly growing demand for expertise in the design and development of eLearning for jobs in industry, government and education [1,3,9]. Whereas the integration concentration focuses on the use of existing technologies to advance education and training, the design concentration focuses on creating new educational technologies. Job titles for the Design concentration include: instructional designers, instructional coordinators, instructional systems analysts, courseware developers, distance education specialists, media producers, educational technology consultants, information specialists, online course developers, educational assessment specialists, and webmasters. Graduates of the program's design concentration will obtain jobs in one of the fastest growing job markets in the United States [10]. For example in the Kansas region, the Bureau of Labor statistics [11] predicts a 33% (2002-12) increase to 120 jobs in 2012 for instructional coordinators alone. As faster and cheaper Internet solutions reach new users, the demand for online educational systems will continue to rise.

Kansas government and businesses in such sectors as medicine and biotechnology (CERNER, and area hospitals), transportation (BNSF), manufacturing (e.g. Boeing, Allied Signal, Black & Veatch), communications (Sprint and AT&T), information technology (Perceptive Software) and the military (Leavenworth, Fort Riley), have ongoing needs to rapidly train their employees and they are increasingly turning to eLearning as a solution for "anywhere" and "just-in-time" training [8]. Consequently, trainers in industry who once taught primarily in classrooms now need additional educational technology expertise in online teaching and the development of eLearning resources [9]. The United States Bureau of Labor Statistics estimates that demand for instructional coordinators, including designers, will grow much faster than the average for all occupations through the year 2014 [12]. This demand is partly driven by the need for expertise in applying technology to the design of educational assessments [12].

Demand for the Administration of Educational Technology

Educational technology administrators are key to implementing the rapid advances in eLearning in industry, government and education settings. The MSEd program's Administration concentration will prepare individuals for positions such as: educational technology coordinator (K-12 schools, community colleges, and universities), director of

instructional development, director of online learning, virtual school administrator, director of continuing education and director of corporate training. For example, many districts are seeking to develop virtual schools, and they are having difficulty finding qualified administrators [15].

The US Bureau of Labor Statistics predicts strong growth for educational administrators, particularly those with expertise in "... distance learning, and technology" [14]. Educational Administrators are also being asked to use educational technology in more comprehensive data driven assessments of their students', teachers' and school's performance. This area of technology-driven assessments alone is anticipated to see very rapid growth, exceeding \$2.52 billion by 2011 [13].

The proposed MSEd in Educational Technology program is designed to be responsive and attractive to business and industry, as well as education. The program makes use of the outstanding interdisciplinary and educational technology resources uniquely available to students on our campus. This includes units that have established KU as a national leader in developing highly regarded eLearning tools and resources that serve millions of users every week, including: the eLearning Design Lab (eDL), Advanced Learning Technology (ALTec), Center for Educational Testing and Evaluation (CETE), Center for Research on Learning (CRL) and Information and Telecommunication Technology Center (ITTC).

The eLearning Design Lab (eDL) and ALTec are extensively involved in the research and development of educational technology. Both units are supported by grants and contracts and offer a wide array of professional experiences for practica and employment opportunities for instructional designers and Graduate Research Assistants. Such experiences include: design, content management, product development, evaluation, dissemination, and technology transfer.

4) Locational and Comparative Advantages of this Program

The program will have the advantage of being located within KU's School of Education, which was ranked in the nations top 10 public universities for excellence in its graduate programs, educational research, and teacher education by the U.S. News Best Grad Schools 2010 report. The program's three concentrations in the (1) Integration, (2) Design, and the (3) Administration of Educational Technology draw on the rich diversity of a major research university and coursework from three departments in KU's School of Education, as well as the EECS, Design, and COMS departments. One of the program's significant comparative advantages is its relationship with the School's Department of Special Education, which, as the nation's top rated program in special education, is a national leader in education technology integration and universal design for accessibility.

With the increasing demand for expertise in Educational Technology, several of the Big 12 universities, including the University of Colorado, the University of Iowa, the University of Missouri, the University of Oklahoma, the University of Texas-Austin, and Texas A&M University, also offer master's programs in Educational Technology. A unique advantage of KU's program will come from its affiliation with KU's outstanding educational technology projects and research and development centers. Over the past 20

years, organizations such as the eLearning Design Lab (eDL), Advanced Learning Technology (ALTEC), Center for Educational Testing and Evaluation (CETE), Information and Telecommunication Technology Center (ITTC), and Center for Research on Learning (CRL) have established KU as a national leader in developing highly regarded eLearning tools and resources that serve millions of users every week. These centers provide an excellent platform for engaging students in highly meaningful experiences and for building the program's reputation.

The state universities in Kansas offering master's programs in "Educational / Instructional Media Design" include Emporia State University, Fort Hays State University and Pittsburg State University. These programs focus primarily on the integration of media in educational settings with Emporia also offering coursework in the design of educational media for the corporate sector. Much of the coursework in these programs is being offered exclusively online.

The proposed MsED in Educational Technology at KU is designed to complement offerings at other Regents institutions while being responsive to growing demand in our region. Through interdisciplinary coursework and its affiliation with the Educational Leadership and Policy department, the program's concentration in the Administration of Educational Technology will provide a unique offering in a growing segment that is currently not a significant part of the other Educational / Instructional Media programs in Kansas. The program will address the increasing demand for expertise in the design and administration of educational technology in our area through both online and face-to-face coursework in the Douglas/Johnson county corridor. The program will also offer supervised practica in the centers on the Lawrence campus who are nationally recognized as expert in the design of educational technology.

With over 20 years experience in integrating educational technology at the preK-12 levels and established roles in the development of educational technology policy at the state and national levels, the Educational Technology program will leverage the School of Education's tradition of collaboration and established relationships with diverse school districts across Kansas. Faculty in the program will draw on these experiences in maintaining a curriculum that is relevant and responsive to the changing educational technology needs in schools. Students in the Educational Technology master's program will benefit through practice and research opportunities where they are directly involved in real-world implementations in the integration, design and administration of educational technology.

Examples of projects and activities that evidence KU's School of Education's broad base of experience in support of an Educational Technology program:

Integrating Instructional Technology in Schools:

- ALTEC teacher tools (http://4teachers.org): TrackStar, QuizStar & RubiStar
- Learning Generation (http://learngen.org)
- eLearning Design Lab (http://elearndesign.org) 50+ online modules for teachers
- The Online Academy (http://onlineacademy.org)
- Blending Assessment with Instruction Program (BAIP) (http://elearndesign.org)

National Training Site (LoTi) (http://www.loticonnection.com/lotilevels.html)

Leadership in Educational Technology Policy and Leadership:

- IID projects in Kansas and Missouri (http://www.pitec.org/ and http://trc.altec.org/)
- Kansas Computerized Assessment to Kansas. (http://kca.cete.us/)
- Leadership in Analyzing Data to Improve Schools (http://elearndesign.org/ladis)
- Founding member State Educational Technology Directors Association (SETDA)

Addressing Diverse Populations:

- Circle of Inclusion (http://www.circleofinclusion.org/)
- Transition Coalition (http://www.transitioncoalition.org/)
- Four Directions (http://4directions.org/)
- Kansas Low Incidence Personnel Preparation (http://www.beachcenter.org/)
- Adaptive Statewide Assessment at CETE (http://www.cete.us/)
- Creators of Equity Index (http://equity.4teachers.org/index.php)
- Creators of CasaNotes (http://casanotes.4teachers.org/) in English and Spanish
- RubiStar in Spanish (http://rubistar.4teachers.org/?lang=SP)
- 4Teachers.org in Spanish (http://4teachers.org/?lang=SP)

The Educational Technology program will also have an advantage in serving the Kansas City metropolitan area through the Edwards Campus. The KU School of Education has a long history of outreach in Johnson and Wyandotte counties and the entire metropolitan area. The proposed program is not only responsive to the needs of educational agencies in these areas, but to private business and other agencies. Just as educational agencies have broadened their approach to education to include technology solutions, such as eLearning, industry has moved in the in the same direction. They have migrated from a model of preparing trainers to deliver training in a face-to-face model to online training approaches. As previously noted, the proposed program will satisfy the need for increased educational opportunities in the area of technology education, as prioritized by the Johnson County Education and Research Triangle (JCERT). With JCERT support, the offering of this program at the KU Edwards Campus in Overland Park will serve a broader audience.

As government and industry move to more eLearning training solutions, they are faced with recruiting more professional staff with skills in instructional design, educational media, web design and curriculum planning. For example, organizations such as the US Army's Command General Staff College and the military in general have made significant investments in the establishment of an infrastructure to support the development of online instruction. Faculty members from the School of Education, through the e-Learning Design Lab, have worked with staff from Fort Leavenworth on eLearning applications. Officers from Fort Leavenworth, executives from AT&T, Sprint and other businesses in Kansas City have earned graduate (master's and doctoral) degrees with a concentration in Educational Technology from the KU School of Education.

The University of Kansas (KU) is a major comprehensive research and teaching university. As one of 62 select public and private research universities with a membership in the prestigious Association of American Universities (AAU), the University of Kansas is noted for excellence in graduate, professional education and research. As such, the KU mission states that the university is "committed to offering the highest quality graduate programs, comparable to the best obtainable anywhere in the nation." The University enjoys a network of scholars that attains high levels of research productivity thereby shaping a discipline as well as promoting excellence in teaching it. Inherent in the University's goals is providing service to the state of Kansas through its state and federally funded research centers and academic programs. The departments and the faculty involved have active research and development agendas that are recognized internationally.

5) <u>Characteristics of the Students in the Educational Technology Program</u>

The Master of Science in Education: Educational Technology degree is designed to prepare students for successful careers in the integration, design and administration of educational technology in preK-12 schools, higher education, government and the private sector. Students who enter the program will be from diverse backgrounds and will typically have considerable interest and skills in using and developing information technologies. Many will be experienced teachers who seek to advance their teaching skills and career aspirations. Several of our master's graduates who began as preK-12 teachers have continued in doctoral programs and currently hold positions as college professors at major universities. The program's master's students also aspire to leadership roles and directors of technology in school districts, higher education, business and industry. The current program has had several foreign students who have returned to their home country to pursue educational technology leadership roles in universities, ministries of education and the private sector. The faculty also have placed many students in regional state and federal organizations, hospitals, as well as businesses such as Burlington Northern Santa Fe, Sprint, AT&T, and Cerner Corporation.

The minimum admission criteria include demonstrated knowledge of information technology and promise of success as educational technology leaders. Previous college transcripts, three letters of recommendation (at least one from an academic who knows the student's professional work), a personal statement, a resume and a completed application are required. A TOEFL score of 590 (CBT- 243) (IBT- 96/97) is required of all international applicants who do not have a degree from a US university. Applicants who meet other admissions standards may be admitted on probation when their undergraduate GPS is 2.75-3.0 on a 4.0 scale. Applicants with a grade point average below 2.75 on a 4.0 scale may be admitted provisionally. The GRE is not required for admission to the master's degree program.

The program has no academic prerequisites other than those discussed above, and applicants from a variety of undergraduate academic backgrounds would be qualified for the proposed new master's program. However because of the coursework required in the Design concentration, students wishing to pursue that concentration should demonstrate coursework or experience in computer programming and media production. It is expected that most students pursuing the Integration concentration will be credentialed teachers, but this will not be a prerequisite for the concentration —thereby allowing individuals from other backgrounds whose interest and experience is in the integration of technology into instructional venues outside of the schools (e.g., business or industry) to select this concentration. Individuals pursuing the Administration concentration should demonstrate appropriate human resources experience, but there would be no curricular prerequisites for students entering this concentration.

Opportunities for Student Interactions

Prospective students completing their bachelor's degree at KU will have the opportunity to consult with staff in the School of Education Advising Center about their career goals and program options. Prospective students may gain interest in the educational technology program during their student teaching. Student teaching field experiences highlight the use of educational technology to improve instruction in the classroom and as a means of enhancing communication between KU and cooperating school districts.

Students within the program will be assigned advisors drawn from the program's core faculty. Advisors and students may interact in regular face-to-face advising sessions, as well as through email, phone conversations, and electronic bulletin boards hosted on course websites. Each faculty member has a dedicated phone line, Internet access, and they make frequent use of online communication tools such as threaded discussions and chats. Students will have ample opportunity to contact advisors to set up a face-to-face meeting or to engage in distance communication.

Student Learning Outcomes

The students learning outcomes are tailored to meet national standards associated with the individual specialization. The Integration concentration will adopt the National Educational Technology Standards (NETS) for Teachers, the Administration concentration will use NETS for Administrators and Design of Educational Technology concentration will adopt the Association for Educational Communications and Technology (AECT) Instructional Media Specialists standards.

National Education Technology Teacher Standards (integration concentration outcomes)

I. Facilitate and Inspire Student Learning and Creativity

Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.

- II. <u>Design and Develop Digital-Age Learning Experiences and Assessments</u> Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes.
- III. Model Digital-Age Work and Learning

Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.

IV. Promote and Model Digital Citizenship and Responsibility

Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.

V. Engage in Professional Growth and Leadership

Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources.

National Education Technology Administrator Standards (administration concentration)

I. Leadership and Vision

Educational leaders inspire a shared vision for comprehensive integration of technology and foster an environment and culture conducive to the realization of that vision.

II. Learning and Teaching

Educational leaders ensure that curricular design, instructional strategies, and learning environments integrate appropriate technologies to maximize learning and teaching.

- III. <u>Productivity and Professional Practice</u> Educational leaders apply technology to enhance their professional practice and to increase their own productivity and that of others.
- IV. <u>Support, Management, and Operations</u> Educational leaders ensure the integration of technology to support productive systems for learning and administration.
- V. Assessment and Evaluation

Educational leaders use technology to plan and implement comprehensive systems of effective assessment and evaluation.

IV. <u>Support, Management, and Operations</u> Educational leaders ensure the integration of technology to support productive systems for learning and administration.

Association for Educational Communications and Technology Instructional Media (design concentration outcomes)

- I. <u>Understanding Instructional Systems Design</u> Instructional Systems Design is an organized procedure that includes the steps of analyzing, designing, developing, implementing, and evaluating instruction.
- II. <u>Understand Instructional Development</u> Development is the process of translating the design specifications into physical form.

III. Understand Utilization

Utilization is the act of using processes and resources for learning.

IV. Understand Management

Management involves controlling Instructional Technology through planning, organizing, coordinating, and supervising.

V. <u>Understand Evaluation</u>

Evaluation is the process of determining the adequacy of instruction and learning.

Curriculum Outling

B. Curriculum of Educational Technology Master's Program

Course #	Name	Credit H	Iours
C&T 709	Foundations of Curriculum and Instruction		3
*C&T 770	Integration of Educational Technology		3
*C&T 870	Educational Media Development		3
*C&T 871	Constructivist Learning Technologies (new))	3
SPED 727	Designing Instruction for Diverse Learning	Needs	3
*C&T 872	Practicum in Educational Technology <u>OR</u>		3
*C&T 897	Independent Study in Educational Technology	ogy	
*C&T 873	Design of Educational Technology		3
*C&T 896	Seminar in Theory of Educational Technolo	ogy	3
PRE 715	Understanding Research		3
Courses in the in	ntegration, design or administration specializ	ations	9
		Total	36

*C&T courses will become ELPS courses upon program approval.

The Master of Science in Education: Educational Technology degree addresses the needs of three major professional specializations to foster leadership in the: (1) Integration, (2) Design, and (3) Administration of Educational Technology. The Integration concentration focuses on strategies for integrating technology in teaching and learning. Typically candidates in this concentration will have some teaching experience and will aspire for leadership roles in integrating educational technology in preK-12 schools, university teacher education, government or industry. The Design concentration prepares students to become leaders in designing instructional systems with technology. Candidates in this concentration often have considerable technical experience and they aspire for roles as instructional design leaders for instructional support and online learning units in preK-12 schools, universities, government or industry. Candidates for the Administration of Educational Technology concentration typically have experience in applying educational technology and they aspire for leadership positions that require expertise in organizational structure, policy and financing as directors of instructional technology in preK-12 schools, higher education, government and industry.

Students choose concentration courses in consultation with their advisor. As a general rule the student will first choose a professional concentration and then select their elective courses.

Integration Concentration (9 hours)

- a) C&T 806 Instructional Strategies and Models (3)
- b) C&T course related to the student's content expertise (3)
- c) Communication Online (choose 1): SPED 804 Designing Online Instruction (3) COMS 620 Communication and New Technology (3) COMS 810 Theories and Research in Organizational Communication (3) COMS 860 New Communication Technology and the Workplace (3) COMS 930 Intergroup and Intercultural Communication (3)

Design Concentration (9 hours)

- a) Programming Prerequisite Students in the Design Concentration must complete the EECS 168 Programming (or equivalent) course to demonstrate their programming knowledge.
- b) Communication Online (choose 2): SPED 804 Designing Online Instruction (3) COMS 620 Communication and New Technology (3) COMS 810 Theories and Research in Organizational Communication (3) COMS 860 New Communication Technology and the Workplace (3) COMS 930 Intergroup and Intercultural Communication (3)
- c) Advanced Design Studies (choose 1) ADS 710 Advanced Human Factors in Interaction Design (3) ADS 770 Design Cognition (3)

Administration Concentration (9 hours)

Students will choose 3 courses (9 hours) from the following based on career aspirations in Educational Administration and/or Higher Education.

ELPS 752 Education Law (3)
ELPS 755 Human Resource Management (3)
ELPS 780 Introduction to Higher Education Administration (3)
ELPS 852 School Resource Management (3)
ELPS 880 The Community and Junior College (3)
ELPS 883 The College Student (3)
ELPS 884 Research on College Students (3)
ELPS 885 Program Evaluation and Assessment in Higher Education (3)
ELPS 981 Higher Education Law (3)

Comprehensive Exam, Practicum and Portfolio

Students in all specializations will a) complete a comprehensive examination, b) engage in field experiences as part of their Practicum or Independent Study course and c) develop a comprehensive portfolio that demonstrates their competencies relevant for their concentration and their intended audience in preK-12 schools, teacher education, universities, government or industry.

C. Program Faculty

The proposed Educational Technology program's two core faculty (100% FTE each) and seven associate faculty members (approx. 20% FTE) are all tenured or tenure-track and hold a doctoral degree appropriate to their area of expertise. Core faculty members will serve as advisors to students in the program and teach the program specific required courses. Students will also have the benefit of learning with faculty from the affiliated departments of Communication Studies, Curriculum & Teaching, Design, Electrical Engineering and Computer Science, Psychology & Research in Education, and Special Education. Appendix B lists the names of the core and associated faculty, their terminal degree, rank, and their academic concentration area. (See faculty profiles in Appendix B.)

<u>Core Faculty</u> (See Appendix B for faculty profiles)

Ronald Aust, Associate Professor, Department of Ed Leadership and Policy Studies

Young-Jin Lee, Assistant Professor, Department of Ed Leadership and Policy Studies

Associated Faculty (See Appendix B for faculty profiles)

Marilyn Ault, Lecture and Director, ALTEC

Richard Branham, Professor, Department of Design

Michael Imber, Professor, Department of Ed Leadership and Policy Studies

Edward L. Meyen, Professor, Department of Special Education

James R. Miller, Associate Professor, Department of Electrical Engineering and Computer Science

Tracy Callaway Russo, Associate Professor, Department of Communication Studies

Sean J. Smith, Associate Professor, Department of Special Education

D. Academic Support for the Educational Technology Program

Graduate Assistantships

With many centers and laboratories related to educational technology, the University of Kansas offers a distinct advantage in terms of graduate teaching and research positions that will provide students with meaningful real-world experiences in developing, integrating, administering and teaching related to educational technology. There are at least two graduate assistantships available each semester to support teaching of educational technology courses in KU's teacher education program. Other educational technology students hold graduate teaching positions in the College of Liberal Arts, teaching language, communications and mathematics courses.

The University of Kansas centers and laboratories such as the eLearning Design Lab, Advanced Learning Technology, Center for Educational Testing and Evaluation, and Center for Research on Learning offer many graduate research position within units that are national leaders in the development and dissemination of educational technology. Currently the program has 11 graduate students employed in these units (6 of whom are in the eLearning Design Lab) who are pursuing educational technology coursework. The faculty believe the employment of these students reflects the maturity of the current embedded program in Educational Technology.

The School of Education Advising Center provides advising services for undergraduate education students; it is supported by the School of Education advising staff, which includes the coordinator of advising, other staff members, and student peer advisors. Advising begins with new student orientation, and continues with staff advisors until admission to the program. Advising is available by appointment in the School of Education Advising Center for individuals; group advising sessions are also regularly held. Once the student is admitted as graduate to the proposed Educational Technology program, faculty associated with the program serve as advisors. No additional advisors will be required.

Library & Other Academic Support

Extensive library holdings are available from the main campus. Furthermore, many curricular, assessment, and resource materials are available to students through its Learning Resource Center. In addition, a variety of technology resources including video cameras, computer projection, color printing (including poster size printing, etc.) are available. No additional library or other academic support is requested.

E. Facilities and Equipment for the Educational Technology Program.

The School's main home is Joseph R. Pearson Hall, a student-centered instructional facility which houses the departments of Curriculum and Teaching, Educational Leadership and Policy Studies, Special Education, and Psychology and Research in Education, as well as many technology-equipped classrooms and other resources for students. Joseph R. Pearson Hall, which was a men's residence hall from 1959 to the late 1980s, became the School's new home in the August 2000 after a dramatic renovation and new construction project transformed it to meet the needs of the School's programs and students.

Students in the program will make extensive use of the computer labs, computer mediated classrooms, educational resource network, video editing and recording capabilities, Learning Resource Center and multimedia support for video and audio recording. Several graduate students have held positions connected with many research centers and projects associated with educational technology including: the eLearning

Design Lab (http://elearndesign.org), the Institute for Educational Research and Public Service (http://www.ku-crl.org), the Center for Educational Testing (http://www.ku-crl.org), The Advanced Learning Technology Center (http://altec.org) and the Center for Research on Learning (http://www.ku-crl.org).

The School of Education Technology Fund provides outstanding support for updating and improving educational technology resources in the School. These funds are used to enhance the quality of classroom technology support, student accessibility to emerging technology and innovative approaches to teaching and research through transnational education, eLearning, biometrics, and constructivist learning environments. Annual School of Education Technology Fund expenditures for 2007 were \$220,000.

Each core and associated faculty member is housed in a private office in the School of Education facility, J.R. Pearson Hall (JRP). Additionally the School of Education Advising Center, the technology resource and support center, Learning Resource Center and media equipped classrooms are also available in JRP. Within these various centers, computer labs, media development labs and small conference and meeting rooms are available to both faculty and students.

Equipment Needs

Each core and associate faculty member (see Appendix B) has a personal computer and phone. The School of Education is already fully wired for Internet and related uses. There are a sufficient number of computers available for student use to make computer use readily available to students. The School of Education regularly replaces computers to ensure that faculty and students have access to computers with the capacity to address current technology applications. Media equipment necessary to provide technology-rich instructional applications and online experiences are also available and updated regularly. Thus, no new initial expenditures for equipment are anticipated.

F. Program Review, Assessment and Accreditation.

As part of the School of Education's periodic program review process, data will be compiled that provide a statistical overview of the program and will include information directed to instructional expenditures, student credit hour production, major and graduation counts and faculty workloads. All courses taught through the Educational Technology program will be evaluated in the same manner as other courses in the School of Education, via enrolled students using the course evaluation instruments currently being used. Additionally, the core faculty will review individual student performance on the portfolios as they relate to the National Educational Technology standards at the end of each semester as part of a program assessment system. Further, periodic input from program field-based supervisors on student performance, and ultimately feedback from the employers of our graduates, will be sought. The office of the School of Education's assessment coordinator, whose responsibilities include follow-up with the school's graduates and employers of those graduates, will work with the program to develop appropriate instrumentation for the above mentioned program assessments and to solicit program feedback from program stakeholders. Collected information will be shared with the program in order that necessary changes to the program can be made in a responsive manner. The program will also be subject to University of Kansas' expectations for program outcome activities.

Program Accreditation

The School of Education is accredited by the NCATE (National Council for the Accreditation of Teacher Education). The School was reviewed via a joint NCATE/KSDE team during spring, 2007. No additional costs to the School of Education are anticipated for implementation or assessment of this new program.

Course Descriptions

Appendix A

Educational Technology Courses

C&T 770 Integration of Educational Technology (3)

This course focuses on strategies for integrating educational technology in preK-12 schools, universities, government or industry. Topics include applying technology in: a) understanding basic technology operations b) planning and designing learning experiences, c) curriculum development, d) assessment and evaluation e) productivity and professional practices, and considering f) social, ethical, legal, and human issues. Students produce a comprehensive electronic portfolio that describes the theoretical perspectives that guide their technology integrations strategies and evidence that demonstrates their competencies.

SPED 727 Designing Instruction for Diverse Learning Needs (3)

Based on the principles of Universal Design for learning, this course focuses on the technology-based solutions applicable to the needs of students with diverse learning needs. Today's instructional and assistive technology solutions often mean the difference between meaningful access to the curriculum and relevant learning. This course introduces core concepts to students and examines how technology can assist diverse learners across the life-span.

SPED 804 Designing Online Instruction for E-learning Environments (3)

The focus of the course is on the status of e-learning at the preK-12 and postsecondary levels and the process of designing content for e-learning applications. Attention will be given to design features, content structuring, instructional management, evaluation, and collaboration in the process of working with technicians in the process of developing online curriculum. Prerequisite: None. A background in education is preferred.

C&T 870 Educational Media Development (3)

Media surrounds today's learning environments. How can you effectively engage learners with multimedia, meaningful interactions, and motivational strategies? This course will take a hands-on practical approach to creating interactive educational multimedia products including, but not limited to, digital images, movies, podcast, Web publishing and educational games. Also, students will learn about the underlying learning theories of educational media development.

C&T 871 Constructivist Learning Technologies

This course explores the design and use of new educational technologies to support constructivist learning. Throughout the course, students will (1) get hands-on experiences with emerging educational technologies, (2) examine how the underlying learning theories are reified into concrete learning environments, and (3) analyze how the affordances of new technologies (e.g., modeling and visualization) can facilitate the constructivist learning processes. This course is suitable for students who wish to develop greater knowledge about the ways emerging computer technologies can empower constructivist learning.

C&T 872 Practicum in Educational Technology

Supervised practice in a media center in selection, classifying, designing, producing and/or managing instructional materials.

C&T 873 Design of Educational Technology

This course introduces instructional design theory and production techniques for developing educational technology resources and systems. Students apply their understandings of design and education theories as they work in teams to develop real-world applications of educational technology for specific clients.

C&T 896 Seminar in Theory of Educational Technology (3)

This seminar explores historical and current theoretical foundations as well as research and development in Educational Technology. Students discuss successful strategies for conducting research, preparing manuscripts and participating in professional conferences. They also have the opportunity to present their research and benefit from the support and critical analysis of their colleagues.

C&T 896 Trends and Issues Associated with Online Instruction (3)

The course examines the opportunities, challenges, cautions, and demands of web-based instruction in higher education. It explores the policy implications of web-based instruction, development of collaborative teaming skills utilizing telecommunications resources, and the design and technical aspects of online instruction. Particular attention is given to the implications of online instruction for accommodating needs presented by diverse learners through strategies such as universal designs. Prerequisite: Admission to doctoral program or permission of instructor.

Curriculum and Instruction Courses

C&T 709 Foundations of Curriculum and Instruction (3)

Basic concepts and processes of curriculum and instruction, including theories, planning models, resources for decision-making, current trends, research and proposals for improvement of curriculum and instruction.

C&T 806 Instructional Strategies and Models (3).

Analysis of models of teaching which represent distinct orientations toward students and how they learn. The application of these models is complemented by the study of research evidence on effective teaching strategies. Prerequisite: C&T 709.

Research

PRE 715 Understanding Research in Education (3)

This course introduces the concepts and skills involved in understanding and analyzing research in education and related areas. The course provides an overview of basic, general knowledge of various research methodologies. Students should expect to study much of this material in greater depth through additional course work before being fully prepared to conduct independent research. However this course should enhance their ability to locate, read, comprehend, and critically analyze research articles and reports. Topics in the course include quantitative and qualitative methods and designs, historical

and descriptive research, and program evaluation. (This course fulfills the requirement of a research methods course in the first 12 hours of graduate study.) LEC include models of intelligence and factors influencing intelligence; measurement characteristics of instruments used to assess cognitive abilities; ethical and legal issues in the use of intelligence tests; and the use of cognitive assessments for identification and diagnosis.

Integration of Educational Technology

COMS 620 Communication and New Technology (3)

This course explores the impact of new communication technology on individuals and groups in various contexts. Topics include: The development of computer-mediated communication, social and psychological impacts of new communication technology, the evolution of telework and advanced in interactive telecommunications.

COMS 810 Theories and Research in Organizational Communication (3)

This survey course introduces the study of organizational communication, a part of the Communication Studies discipline that focuses on interactions within organizations, whether these are for-profit, not-for-profit, social, or civic organizations. The course first addresses ways in which people have framed the study of communication in organizations. It then looks at contexts of organizational communication, including organizational entry and socialization, superior-subordinate relationships, peer relationships, communication in groups, power relationships in organizations, and organizational change.

COMS 860 New Communication Technology and the Workplace

an examination of changes in the work place and for workers associated with new communication technologies, such as e mail, voice mail, teleconferencing, distributed processing, and computer-supported decision making. Emphasis is on changes in organizational communication patterns, participant responses to the technologies, and evaluation of the outcomes of implementing work place communication technologies. (Edwards Campus)

COMS 930 Intergroup and Intercultural Communication (3)

Conceptual and theoretical frameworks for exploring and understanding relations between individuals from different social groups (e.g., cultural/ethnic, gender age). Focus on issues of identity, power relations as manifested in interpersonal, mass media, and organizational contexts. The course will include methodological and applied implications for studying different groups, both within the US and around the world.

Design of Educational Technology

ADS 710 Advanced Human Factors in Interaction Design (3)

The study of human factors principles and guidelines are fundamental to interaction design. In this course, these principles will be illustrated and applied to real-world design projects/problems. Human physical and cognitive capabilities, computer-human interface and systems properties, interaction design methods, and the physical and socio-cultural environment will be considered. Fundamental issues in human-centered systems, basic research methods, including statistics and literature searches, will be included. Open to

all university students. Graduate students will meet concurrently with INDD 510 and receive additional course work.

ADS 770 Design Cognition (3)

In a science of design, the study of "human designers" is as important as the study of designed artifacts or design tools. Since the beginning of research in Design Cognition, many empirical studies have opened up our understanding of human designers and the ways they design. While design is largely a mental activity, it interacts strongly with heterogeneous external representations. It encompasses problem definition and solving, analogical mappings, mental imaging and other mental processes. It requires team coordination and is situated in a cultural milieu that defines roles and modes of behavior. As such, distributed cognition, situated cognition, and social cognition – all have become relevant to the understanding of design cognition. The structure of a design task, the mental representation of design form and behavior, the structure of design teams, and the associated concepts of design cognition will be the subject of the course.

Administration

ELPS 752 Education Law (3)

A study of legal principles and issues affecting educational policy making and practice with emphasis on student and teacher rights, equity, and the administration of schools. Prerequisite: Admission to graduate study.

ELPS 755 Human Resource Management (3)

An overview of the theory and practice of the management, recruitment, selection, compensation, placement, and development of personnel in the school setting.

ELPS 780 Introduction to Higher Education Administration (3)

This course is designed for beginning master's degree students and for doctoral students who have had no previous administrative experience in college or university settings. Students will be introduced to the function and responsibilities of major administrative divisions of a college or university and to the major tasks of administration: planning, programming, budgeting, staffing, and managing. An emphasis will be placed on current issues facing higher education and students will be introduced to the major journals of the field. As part of the course requirements, students will spend some time familiarizing themselves with one or more administrative offices on a college campus.

ELPS 852 School Resource Management (3)

An examination of the sources and uses of fiscal resources in education including underlying concepts from economic theory, the impact of values on fiscal policy, state funding formulas, and school budgeting and accounting practices.

ELPS 880 The Community/Junior College (3). A survey of the history and development of the community/junior college. Particular emphasis will be given to the student, the faculty, the curricula, administration, and finance. The course is intended to provide a general understanding of the operation and concerns of today's community/junior college for the current or potential community/junior college staff member.

ELPS 883 The College Student (3)

The characteristics of college students; impact of college on student behavior, changing attitudes, values, beliefs, and the implications of recent research on traditional and new students for instructional and administrative practices.

ELPS 884 Research on College Students (3)

Examination of the American college student from societal, development, research, and institutional perspectives to review the policy implications of these findings for college and university administrators and faculty. Topics include research and theory concerning the college student experience, the diverse nature of the student body and its implications for institutional policy and practice, and formulation of individual philosophies and priorities applicable to working with college students.

ELPS 885 Assessment and Program Evaluation in Higher Education (3)

Nature, objective, and basic procedures of assessment and program evaluation as applied to the various aspects of higher education settings. In addition to basic procedures for evaluating programs, topics covered include accreditation, program review, benchmarking, student outcomes assessment, and evaluation of teaching in colleges and universities.

ELPS 981 Higher Education Law (3)

An overview of the developing law of higher education, with emphasis on an analysis of employer-employee relationships, student-faculty / administration relationships, and the impact of federal and state regulation on these relationships.

Faculty Profiles Appendix B

Ronald Aust, Associate Professor, Department of Educational Policy and Leadership, University of Kansas

Ron Aust holds a doctoral degree from the University of Washington where he focused on Educational Technology. His research and teaching at the University of Kansas centers on the design of technology-rich learning environments. Aust has extensive experience in leading software development for eLearning and other educational applications using the Internet. While at KU, he has served as principle or co-investigator for over \$16 million in funded research and development projects. He coordinated development of the UNITE distributed database system which established the Explorer collection in 1993 as one of the first educational libraries on the Internet. He has subsequently directed several national and international efforts that apply technology to advance learning with diverse populations. His current interest is in the design and development of systems used to create, organize and manage educational content and online learning in international settings.

Richard Branham, Professor, Department of Design, University of Kansas

Richard Branham is currently working in the areas of cognitive human factors and interaction design strategies, methods and techniques, specializing in way-finding, navigation and use models. Branham has thirty-four years of professional design experience in developing interfaces between people and technology (Human-Centered Design) and twenty-five years of teaching and research experience. He holds bachelor's and master's degrees of fine arts from The University of Kansas and a master's degree from the Institute of Design, Illinois Institute of Technology.

Branham has published, lectured and worked in the Americas, Europe, Africa and Asia. In the 1960's, Branham founded the Information and Design Systems Division of Unimark International, one of the world's largest design consultancies. In the 1970's, Branham founded Design Planning Group in Chicago; major clients included Carlton Centre, Johannesburg, Gillette Company, Boston, Marshall Field and Company, Chicago, J. C. Penney Company, New York, Volkswagen InterAmerica, Mexico City, and Westinghouse Electric Corporation, Pittsburgh, and many others.

Michael Imber, Professor, Department of Educational Leadership and Policy Studies, University of Kansas

Michael Imber received his doctoral degree in education from Stanford University in 1980. He is author of many books, articles and scholarly presentations on various topics of educational administration, policy and law. Imber has extensive experience advising school board members, educators and lawyers on issues of educational policy and law and working with children and adults with disabilities. He has worked as a consultant to schools in Africa and Latin America. He also spent four years as the director of a school for at-risk students.

Young-Jin Lee, Assistant Professor, Department of Educational Leadership and Policy Studies, University of Kansas

Young-Jin Lee holds a bachelor's in astrophysics and a master's in science education from the Seoul National University, and a doctoral degree from the University of Illinois at Urbana-Champaign where he specialized in educational computing. After earning his doctorate, Lee worked at the National Center for Supercomputing Application (NCSA) as a visiting senior research programmer and mostly recently at the Massachusetts Institute of Technology (MIT) as a research associate. Lee has extensive experience in developing educational software. While working for NCSA, he developed a Web-based histology learning environment for medical students and professionals. He also participated in a NSF-funded research project, while working at MIT, to develop a Web-based physics tutoring environment which has been commercialized by Pearson Education. Lee's current research interests include educational use of innovative computer technologies such as intelligent tutoring systems, efficient tutoring in online learning environments, and constructivist learning environments especially for mathematics and science.

Edward L. Meyen, Professor, Department of Special Education, University of Kansas

Edward L. Meyen is Co-Director of the e-Learning Design Lab (eDL), a collaboration of the Information and Telecommunication Technology Center and the Center for Research on Learning at the University of Kansas. He is also a professor of special education specializing in instructional design and e-learning environments All of his courses have been taught online since 1996. The eDL was a finalist in the International Competition on Software Products for Web-Based Education for both the 2005 and 2007 competitions in Switzerland and France, respectively. Meyen was the principal investigator for the Online Academy that developed 22 online instructional modules for teacher education programs. The modules have been adopted by over 180 institutions nationally. Since 2001, the eDL has carried out 15 externally funded research and development projects focusing in on eLearning for adults and school-aged learners. His recent publications in eLearning have focused on the areas of scalability, content management, knowledge management, design, assessing student performance, beta testing, formative evaluation, theoretical constructs, content validation and implementation. Meyen worked with the Center for Educational Testing and Evaluation on the development of instructional resources, blending assessments with instruction in mathematics for grades 3-10 that were implemented online statewide in 2007.

James R. Miller, Associate Professor, Department of Electrical Engineering and Computer Science, University of Kansas

James R. Miller worked for eight years in industry before returning to academia in the fall of 1987. His research interests lie in graphics, visualization, geometric modeling, and the use of computers and technology in education. His current research projects include multidimensional and multivariate visualization schemes, and eLearning. He regularly teaches courses across the curriculum, including the first three programming and programming language courses as well as a senior-level course in computer graphics and three graduate level courses in advanced areas of graphics, modeling, and visualization. He earned his bachelor's degree in Computer Science from Iowa State University, and his master's and doctoral degrees in Computer Science from Purdue University.

Tracy Callaway Russo, Associate Professor, Department of Communication Studies, University of Kansas

Tracy Russo holds a doctoral degree in Communication Studies from KU. She teaches classes in organizational communication and technology and communication. Her bachelor's degree is from Indiana University, and she has master's degrees from Syracuse University and Rockhurst University. Before coming to KU, she spent 17 years with Knight-Ridder Financial Information, Inc., in jobs ranging from copy editor to senior vice president/editorial and vice president/administration. Her teaching and research interests are in organizational attachment and the relationships among communication behaviors, attachment, and performance in distributed teams and groups, especially online classes. Russo received a Kemper Fellowship for excellence in teaching and was a finalist for KU's H.O.P.E. teaching award. In 2001, she was named a fellow of the Carnegie Foundation for the Advancement of Teaching. She directs the graduate program in communication studies at KU's Edwards Campus in Overland Park.

Sean J. Smith, Associate Professor, Department of Special Education, University of Kansas

Sean J. Smith has a background in the area of special education and technology, specifically towards the integration of technology across teacher preparation programs. He has authored and presented a number of articles and papers dealing with special education technology and is currently a project director on several US Department of Education program initiatives seeking to further the integration of technology components across teacher preparation programs and into the lives of students with disabilities as well as the development of a virtual social skill training experience for students with Aspergers syndrome. Smith has served as an associate editor for the *Journal of Special Education Technology* and authored a quarterly column on technology and teacher education for this publication. He is also the proud parent of four young children, one having an intellectual disability.

References:

- Allen, E. & Seaman, J. Staying the course: Online education in the united states, 2008. The Sloan Consortium, Needham, MA. November 2008. (http://www.sloanc.org/publications/survey/index.asp)
- [2] Posny, A. Welcome to the 19th annual education technology fair. Kansas State Department of Education. 2008. (http://conferences.ksde.org/Default.aspx?tabid=1643)
- [3] Picciano, A. G. & Seaman, J. K-12 Online Learning: A 2008 follow-up of the survey of u.s. school district administrators. The Sloan Consortium, Needham, MA. January 2009. (http://www.sloan-c.org/publications/survey/index.asp)

- [4] Christensen C. M. & Horn M. B. How do we transform our schools? Education Next v8(3). Hoover Institution, 2008.
 (http://www.hoover.org/publications/ednext/18575969.html).
- [5] P21. 21st century skills professional development. Partnership for 21 Century Skills 2007. (http://www.21stcenturyskills.org/).
- [6] Hassan, B.N. & Ritz, J.M. Technology education teacher demand, 2002-2005. The Technology Teacher, April 2003. (http://www.iteaconnect.org/Resources/TeacherDemand.pdf).
- [7] USDE. Toward a new golden age in american education: How the internet, the law and today's students are revolutionizing expectations. The National Educational Technology Plan. United States Department of Education, 2008. (http://www.ed.gov/about/offices/list/os/technology/plan/2004/site/edlitedefault.html).
- [8] Moses, A. R. Stimulus package to quickly impact education technology. Edutopia. February 2009. (http://www.edutopia.org/economic-stimulus-education-schooltechnology)
- [9] Bersin. J. Top trends in e-learning and corporate training. 2007. Retrieved February 26, 2008 (http://www.skillsoft.com/infocenter/documents/050107_HRManagement.doc)
- [10] DOL. High growth industry profile: Information technology. United States Department of Labor. February 29, 2009. (http://www.doleta.gov/BRG/Indprof/IT_profile.cfm).
- [11] US bureau of labor statistics: Mountain-Plains Information Office. Washington DC, 2009. (http://www.bls.gov/ro7/ro7_ks.htm).
- [12] US bureau of labor statistics: Instructional coordinators. Occupational Outlook Handbook, 2008-09 Edition. Washington DC, 2009. (http://www.bls.gov/oco/ocos269.htm).
- [13] Formative assessment to drive u.s. k-12 academic testing market in 2008. Simba Information, 2008. (http://www.simbainformation.com/about/release.asp?id=1156).
- [14] US bureau of labor statistics: Education administrators. Occupational Outlook Handbook, 2008-09 Edition. Washington DC, 2009. (http://www.bls.gov/oco/ocos007.htm).
- [15] US bureau of labor statistics: Human resources, training, and labor relations managers and specialists. Occupational Outlook Handbook, 2008-09 Edition. Washington DC, 2009. (http://www.bls.gov/oco/ocos021.htm).
- [16] Arnoldy, B. Virtual schools see strong growth, calls for more oversight. The Christian Science Monitor, May 14, 2008. (http://www.csmonitor.com/2008/0514/p03s08-usgn.html)