

Initiative Biographies

The group of professors who participated in The Scholarship of Teaching Initiative were a dedicated faculty group. They joined the Faculty Learning Community with open, professional, and enquiring attitudes. Their humor and ability to critique themselves was outstanding throughout the entire process of critical reflection and development. Each faculty member involved in this pilot initiative reflected his or her serious interest, dedication to teaching and learning, professionalism, camaraderie, and leadership without question. Very important to the program leadership is that they were extremely supportive of the leaders. As one of those, I must say that I have never been treated more professionally or respectfully. And although the Initiative activities were well researched and developed, described, discussed, and agreed to at the beginning of the program, it was impossible to realize at that time what the full extent of the work load would be as it was a pilot program and our first time offering the program. However, each and every faculty participant completed everything asked of them; they were tolerant – allowing aspects of the program to develop as the process and content evolved. As anyone who leads professional development knows, regardless of how well the content is planned, even when based upon an extensive and diversified needs assessment, and how well all the materials are developed, each individual and group collectively is different, and things become known that were not beforehand, or adjustments must be made that were not predictable, or a program component is needed that was unexpected, and more. The most significant outcome of the experience was that there is now a group of eight professors who would like to continue to work together on teaching and learning. Some of us wondered throughout the process why we had not worked together before. That outcome is what we hoped would occur.

Promod Vohra, Ed.D., PE, CSIT- Electrical Engineering. Dean, College of Engineering and Engineering Technology. Well published. Outstanding grant awards and industrial contracts.

Regarding this Initiative, the most important points to make about the Dean of the College are about leadership. He has a vision that fully acknowledges and includes The Scholarship of Teaching as Boyer (1990) intended it to be, integrated, interactive, interdisciplinary, and equal to all other types of research: discovery, integration, and application. Most important is that he believes in “Transforming Leadership” as defined by Burns (1978) and “Superleadership” as defined by Manz and Sims (1989). These theories are all about transforming others into leaders or acknowledging and empowering the leadership capabilities in others; they involve the development of leaders where everyone is raised to higher levels intellectually, morally, and ethically. This initiative is all about leading and empowering others; that is the heart of teaching and learning. We provide learning experiences where our students achieve their highest possible potential in their time with us and go on to achieve more. We develop their intellectual and personal capability to learn, lead, and ultimately to transform their world. Dean Vohra has elevated “teaching” to its rightful status among scholarly activities in the college. He has empowered the program leader, acknowledged her experience and capability to lead a group of engineering and technology faculty, and empowered the faculty members to formally create and engage in a learning community that will sustain scholarship on teaching for the future; they have now become the leaders as they no longer need the initial leader. Dean Vohra has committed to sustaining leadership and support and quietly empowered his faculty in the true sense of “empowerment” where one gives up their own power to empower others to lead.

Faculty Participants

Abul K.M. Azad, Ph.D. – Electrical Engineering. Associate Professor, Electrical Engineering Technology. Interests are logic design, microprocessing, communication systems design, digital communications. Significant Grants awarded by the National Science Foundation, the U.S. Department of Education, and the Engineering and Physical Science Research Council, UK. Grant focii: Robotics, program development, and analysis of railroad barriers for transportation planning. Well funded by NIU for internal grants: web based laboratory development, design and development of crowd control system for public spaces, internet based simulation and control of environment; intelligent modeling; artificial intelligence for robot manipulators; collaborative interdisciplinary simultaneous engineering project development, and more. Published articles include the following topics: Internet-based laboratory experiments in engineering technology; Design and development of a cost effective data acquisition system using PC's parallel port; Internet-based facility for physical laboratory experiments. He co-edited *Flexible Robot Manipulators-Modeling, Simulation and Control*. UK.

Coller, Brian, Ph.D. - Mechanical Engineering. Assistant Professor, Mechanical Engineering. Industrial experience includes Hughes Aircraft Company. Interests are digital control, dynamic systems and control, engineering mathematics. Grants awarded by the National Science Foundation. Grant focii include nonlinear dynamics of triggering controllers, advanced computing in mechanical engineering, automotive engineering, ethanol vehicles, and more. Published articles on Intriguing nonlinear dynamics of a controller with a sluggish actuator; Surge/stall interactions in compressors; Open loop control of planar diffuser flow; A study of double flutter; Structural nonlinearities and the nature of the classic flutter instability; Optimization of an E85 powered Chevrolet Silverado; Vortex model for control of diffuser pressure recovery; Beneficial actuator-induced bifurcations in compressor control; Evolving control strategies for suppressing heteroclinic bursting, and more.

Abhijit Gupta, Ph.D. – Mechanical Engineering. Associate Professor Mechanical Engineering. Significant Grants/industrial contracts awarded on vibration analysis of exhaust systems; modal analysis of V229; vibration analysis of sensor and port; analysis and design of pelican guide wheel suspension; fatigue behavior of foams. Co-lead on acoustics and vibration project. Published articles on: finite elements; development of adaptive algorithm for active sound quality control; active vibration control of a structure by implementing filtered-XLMS algorithm; a direct method for matrix updating with incomplete measured data and without spurious modes; effectiveness of a sprayable damper studied using multiple test methods; electromagnetic shock absorbers; a damage identification method using vibration modal parameters through finite element discretization, and more.

Reinaldo Moraga, Ph.D. – Industrial and Systems Engineering. Assistant Professor Industrial and Systems Engineering. Interests are statistics for engineers, operations research, industrial control systems, systems simulation, simulation modeling and analysis, discrete systems simulation, advanced experimental design for engineers. Grants awarded on application of operations research and management science models in disaster operations management; modeling and simulation of cost considerations throughout design processes; design of heuristics for production scheduling problems; systems models and process optimization; extensions of meta-RaPS to machine

scheduling problems; effective solution approach for solving the 0-1 multidimensional knapsack problem; simulation modeling and analysis of space shuttle flight hardware ground processing; risk analysis methodologies, techniques, and tools for ground operations. New professor; grant proposals in process. Patents: Virtual Reality Interactive Software for Teaching in Robotic and Material Handling Systems; Garden Table. Publications on using system dynamics, neural nets, and Eigenvalues to analyze supply chain behavior; application of SCOR to E-Government; detecting and analyzing patterns in supply chain behavior; disaster and prevention management for the space shuttle during lift-off; heuristic approaches for the unrelated parallel machine scheduling problem with machine-dependent setup times, and more. Book Chapters include *Meta-heuristics: A solution Methodology for Optimization Problems* in Handbook of Industrial and Systems Engineering; *Technological Proposal for Computer Aided Education: Two Cases of Virtual Reality Applications* in Gestion de la Docencia e Internacionalization en Universidades Chilenas.

Ibrahim M. Abdel-Motaleb, Ph.D., PE – Electrical Engineering. Professor Electrical Engineering. Interests are electrical circuit design and analysis; semiconductor devices and fabrication; integrated circuits; electrical microsystems. Grants or contracts awarded by industry on rapid optimization of commercial knowledge for U.S. Army-Vehicles Center for Bribology and Coatings; testing and evaluation of S&N relay for use in earth movement vehicle; nanofabrication education; characterization of ZnSe/Ge Hetrointerface using BioRads SLTS system and electrochemical C-V profiler; investigation of nitrogen doping on field emission device characteristics; magnesium diffusion in gallium nitride; characterization of magnesium oxide MOS capacitor; zinc selenide semiconductors; integrated microelectronic systems; also, MEMS sensors; nanotechnology; material growth and characterization; device fabrication and characterization; integrated circuit fabrication; modeling and simulation. Publications on modeling and simulation of bipolar junction transistors using the theories of thermodynamics; characterization of ZnSe/Ge material growth using the Atomic Force Microscope; non-quasi static modeling of HBT junction capacitance; and more.

Regina DeMers Rahn, Ph.D. – Nuclear Engineering. Assistant Professor in Industrial and Systems Engineering. Industrial experience at GeneMetrix. Interests are quality control; manufacturing systems; six sigma performance excellence; modern problem solving; productivity and modeling and improvement; process capability; process modeling; reliability; engineering statistics; decision modeling. Publications on potential distribution in a remote hollow cathode glow discharge deposition source; technical feasibility studies, tag design computer code; weighted median method for centerline estimation; cost/throughput improvement; quality improvement. Director of Carter Program for Women in Engineering; Research/development/industry contracts on high resolution software for performance metrics; new methodology for job shop scheduling, capacity calculations, and cost estimations.

Robert Tatara, Ph.D. – Chemical Engineering. Assistant Professor, Plastics Technology. Interests are chemical qualities of plastics/composites; manufacturing processing and technology; heat transfer; fluid mechanics; engineering thermodynamics; experimental methods in engineering; refrigeration and air conditioning. Research/industrial contracts on manufacturing potential for ethanol processing residue streams; use of corn processing co-product as a biofiller material in a plastic resin; thermoforming; high temperature excursions due to shear heating, during injection molding of ABS plastic melts; special mode inserts to lengthen cooling time of injection molded

plastic parts to reduce residual stresses; quantified effects on resin melt viscosities of filler materials using a capillary rheometer; plastic processing simulation software evaluation. Co-Investigator “Experimental Determination of the effects of Oil on Heat Transfer in Flooded Evaporators.” Publications on analytical and experimental studies of properties of ethanol coproduct-filled plastics, modeling injection molding procession of a polypropylene closure having an integral hinge; measurement of forces developed by a double-acting mopneumatic cylinder; measurement of spray boiling refrigerant coefficients in an integral-fin tube bundle segment simulating a full bundle; pool boiling of pure R134a from a single Turbo-BII-HP tube; effects of oil on boiling of replacement refrigerants flowing normal to a tube Bundle-(art II. R-134a and 123); and more.

Jerry Gilmer, Ph.D. – Educational Psychology, Measurement and Statistics. Director of Testing Services, NIU. Program Associate. Developed and taught the student assessment program component on test analysis and development. Collaborated with Jule Scarborough on the program and classroom research design, methodology, and statistical procedures. Developed and produced the research designs and statistical reports on program. Industrial experience as measurement specialist, research scientist assistant, and director of Law Programs Test Development.

Gail Jacky, Director of NIU’s Writing Center. Edited the Portfolio with great patience and always a smile.

Jule Dee Scarborough, Ph.D. – Distinguished Professor, Emeritus. Technology-Emeritus, 2007. Researched, conceptualized, developed, directed, and taught most of the faculty development program and research semester for The Scholarship of Teaching. Produced and documented all of the conceptual research; designed and developed all the program process, teaching and learning materials (e.g., instruments, feedback and evaluation forms, program worksheets, presentations, etc.). Designed program and classroom research, methodology, and statistical procedures in collaboration with Jerry Gilmer. Documented and produced the College Portfolio. Distinguished grants and teaching professor. W.K. Kellogg National Leadership Fellow. Studied in 46 countries for extended time. Nationally recognized and awarded for research, teaching, and professional activities. Recognized and awarded by NIU. Grant awards total approximately 10 million from National Science Foundation, State of Illinois; also, additional contracts with business and industry. Active with business and industry as consultant, grant partner, and research on leadership in manufacturing sector. Outstanding Graduate Professor. Teaching areas include Industrial and Engineering Management and Leadership. Program Leader - Project Management Graduate Certificate and Master’s Specialization. Twenty-five years teaching graduate courses on Total Quality Management, International Business, Industrial Leadership, Advanced Project Management, High Performance Teaming, and undergraduate senior design capstone; also 16 years teaching engineering/industrial technology: automated manufacturing (e.g., automated systems, PLCs, automated controllers, senior design capstone course). Twenty-three years working with high schools to improve mathematics, science, and technology in secondary education. Well published. Retired 2006.