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A Learning Village: Utilizing a Holistic Approach to Create Connections between Community College Pre-Engineering Students and Iowa State's College of Engineering

Jacquelyn A. Baughman
Iowa State University, jacquelyn@iastate.edu

Steven K. Mickelson
Iowa State University, estaben@iastate.edu

Mary Darrow
Iowa State University

Mary Elizabeth Goodwin
Iowa State University
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 Leigh Chrystal
Part of the [Digital Resource and Agricultural Engineering Commons](#), and the [Engineering Education Commons](#)
Iowa State University

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Abstract

As part of a 5-year NSF grant, the partnership between Iowa State University (ISU) and Des Moines Area Community College (DMACC) resulted in the Student Enrollment and Engagement through Connections (SEEC) project. This project is driven by five distinct Objective Teams (O-Teams) with each responsible for achieving specific objectives. These objectives are directly aligned with the project's goal of increasing the number of students entering and earning an engineering degree at ISU. The SEEC project provided the opportunity to model and build a "learning village" based on ISU's nationally recognized learning community foundation, and to increase student connections between these Iowa educational institutions. The intent of this paper is to chronicle the accomplishments of one of the O-Teams, the Learning Village Team, in the quest to achieve its overarching objective of "building a learning village that enhances student connections and creates ISU connections for community college pre-engineering transfer students."

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Authors

Jacquelyn A. Baughman, Steven K. Mickelson, Mary Darrow, Mary Elizabeth Goodwin, Lora Leigh Chrystal, Paul Castleberry, Jennifer Garrett, Paul Gruenewald, Randy Jedele, Mani Mina, Harry McMaken, Kevin P. Saunders, and Randy Smith

AC 2009-181: A LEARNING VILLAGE: UTILIZING A HOLISTIC APPROACH TO CREATE CONNECTIONS BETWEEN COMMUNITY COLLEGE PRE-ENGINEERING STUDENTS AND IOWA STATE'S COLLEGE OF ENGINEERING

Jacquelyn Baughman, Iowa State University

Graduate Assistant and Doctoral Student Ag & BioSystems Engineering

Steven Mickelson, Iowa State University

Director, CELT Associate Dean Associate Professor Ag & BioSystems Engineering

Mary Darrow, Iowa State University

Program Coordinator and Doctoral Student Educational Leadership & Policy Studies

Mary Goodwin, Iowa State University

Program Coordinator Engineering Academic/Student Affairs

Lora Leigh Chrystal, Iowa State University

Program Coordinator Program for Women in Science and Engineering

Paul Castleberry, Iowa State University

Student Service Specialist Engineering Academic/Student Affairs

Jennifer Garrett, Iowa State University

Program Coordinator Memorial Union

Doug Gruenewald, Iowa State University

Program Manager Vice President Student Affairs

Randy Jedele, Des Moines Area Community College

District Chair Communications

Mani Mina, Iowa State University

Senior Lecturer Electrical and Computer Engineering

Harry McMaken, Des Moines Area Community College

Instructor Math/Engineering

Kevin Saunders, Iowa State University

Program Coordinator Executive Vice President & Provost

Randy Smith, Des Moines Area Community College

Instructor Mathematics Department

Mary Darrow, Iowa State University

Mary Darrow is a doctoral student in Educational Leadership and Policy Studies (ELPS) at ISU. She has extensive community college experience, and came to ISU from DMACC. She is currently the project coordinator for the SEEC project, and is also involved in many STEM

initiatives at ISU.

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Abstract

As part of a 5-year NSF grant, the partnership between Iowa State University (ISU) and Des Moines Area Community College (DMACC) resulted in the Student Enrollment and Engagement through Connections (SEEC) project. This project is driven by five distinct Objective Teams (O-Teams) with each responsible for achieving specific objectives. These objectives are directly aligned with the project’s goal of increasing the number of students entering and earning an engineering degree at ISU. The SEEC project provided the opportunity to model and build a “learning village” based on ISU’s nationally recognized learning community foundation, and to increase student connections between these Iowa educational institutions. The intent of this paper is to chronicle the accomplishments of one of the O-Teams, the Learning Village Team, in the quest to achieve its overarching objective of “building a learning village that enhances student connections and creates ISU connections for community college pre-engineering transfer students.”

Introduction

In response to the 2006 study by a National Academies committee, “*Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*”¹, the SEEC project is vital to our economic success, both at the state and national level, in order to produce more scientists and engineers. A 2007 report published by the U.S. Department of Labor² states that:

STEM fields have become increasingly central to U.S. economic competitiveness and growth, and long-term strategies to maintain and increase living standards, and promote opportunity will require coordinated efforts among public, private, and not-for-profit entities to promote innovation and to prepare an adequate supply of qualified workers for employment in STEM fields. (U.S. Department of Labor, 2007, p.1)

In reviewing the work of Handel³ and a 2005 National Academies⁴ report, the team decided to focus their activities on some these recommended approaches to a successful community college student transfer process. With this in mind, the Learning Village Team felt that a key part of success in increasing the number of engineering students from a pre-engineering pool of potential transfer students hinged on building connectivity and a “sense of community”. In our view, these vital connections would enhance community college students’ engagement, and thus lead to an increased likelihood of a successful transfer and transition to ISU’s College of Engineering.

The Learning Village

Who we are

The composition of the Learning Village Team, as a partnership O-Team, mirrors that of the SEEC Executive Team, and members include both DMACC and ISU stakeholders: staff, faculty, and students. In order to ease the transfer and transition of pre-engineering students from DMACC to ISU's College of Engineering, the team began to build an infrastructure with key success factors that include: peer mentoring, an engineering orientation course hosted at DMACC's –Ankeny campus, expansion of ISU's newly launched Admissions Partnership Program (APP), and development of a social network. As a result, the Learning Village Team is on the cusp of successfully implementing positive and sustainable changes for pre-engineering transfer students. In order to achieve its objective of “building a learning village that enhances student engagement and creates ISU connections for community college pre-engineering transfer students”, the Learning Village Team utilizes a Logic Model format. Provided by the Evaluation O-Team, this format allows for the planning of resources and activities leading to tangible outputs that are tied to short and long-term outcomes, and in addition, measures of progress were also developed. During an established meeting time, the team reviews the logic model, reports out progress and determines actions necessary in order to achieve the intended outcomes. This approach effectively utilizes membership expertise, and provides team structure.

Beginning to build connections

One of the first activities our cross-institutional team engaged in was the development of an engineering orientation (EGR 100) course, which was facilitated by ISU and DMACC. This course was launched at the DMACC- Ankeny campus during the spring 2008 semester, and incorporated an ISU engineering upperclassman as a course peer mentor. The peer mentor was available for the pre-engineering students both in and out of the classroom. Since this initial course offering, enrollment nearly doubled, and during the fall 2008 semester, two additional peer mentors were hired, and the building of a social network on Facebook began. The social network on Facebook was developed as a mutual “product development” project between the ISU peer mentors and students from the EGR 100 course. The building of a mutually beneficial social network allowed students to interact and connect with each other as well as with the peer mentors.

The EGR 100 course provided many opportunities for our team to learn about the needs of these pre-engineering students. One important piece of input into our team's work was the students' own perceptions of what would be helpful in order to increase transfer success from DMACC to ISU's College of Engineering. Both the spring and fall 2008 students perceived advising as the number one success factor, followed closely by help with science/math classes, transfer credit evaluation, and the admissions process. Interestingly, the greatest perceived concern was class difficulty. This information was gathered as part of the first assignment “Getting to Know You”, administered both in the spring 2008 and fall 2008 semesters.

Based on the spring 2008 semester student feedback, items were incorporated into the fall 2008 EGR 100 course in order to address student perceptions and concerns. To address the advising concern, students were encouraged apply for ISU's newly launched Admissions Partnership Program (APP) during the course. Students were provided with APP applications and assistance

from DMACC advisors during the first two weeks of the fall 2008 course. Peer mentors also provided assistance, guidance, and shared their own success stories as former pre-engineering APP students that had successfully transferred and transitioned to ISU. During the fall 2008 semester, ISU College of Engineering advisors provided on-site advising at the DMACC-Ankeny once a week for two months. The students were encouraged through announcements in the EGR 100 course to seek out this advising, and to also utilize this as an opportunity to explore their engineering program of interest. This advising was provided both for APP and non-APP students to promote interaction with ISU engineering advisors, and fulfill their perceived transfer needs. During the course of the semester the students were involved in developing their own individual transfer plan with their ISU advisor utilizing a common format. This provided continued interaction and communication with their ISU advisor, and as part of the course assignments, also instilled a sense of responsibility for their own unique transfer plan development based on their individual needs.

Also, during the fall 2008 course, students were introduced to TRANSIT, ISU's user-friendly, online transfer credit evaluation system. This system was part of the state legislature's mandate to the three Iowa Regent institutions, and provides students with a method to determine individual community college course transferability to ISU's College of Engineering. In addition, this allows students the opportunity to play "what-if" scenarios based on their course taking pattern at DMACC, and how these courses transfer within different engineering programs at ISU. Initial feedback on utilizing TRANSIT as input into the development of an individual transfer plan was very positive. TRANSIT's output establishes a common communication format between the student and their ISU engineering advisor, and increases advising efficiency and effectiveness by providing a "draft" of a degree audit. This "draft" degree audit can be easily reviewed by the advisor and student during a meeting or via email in order to develop a transfer plan that is visible and tangible to the student.

In addition to advisor interaction, the students were provided guest speakers during the spring and fall 2008 semesters of the EGR 100 course. The speakers were diverse, and included ISU College of Engineering faculty members, advisors, and staff members from career services, as well as, industry professionals. Based student evaluations for the fall 2008 semester, the guest presentations were the highest rated portion of the course. Based on student comments, the guest speakers provided real-life information that the students perceived as very valuable in their understanding of engineering, how to successfully obtain an engineering position, and what opportunities exist for engineers in the job market.

Other activities that the Learning Village O-Team has been involved in include improvements in ISU's College of Engineering career fair to include a focus on community college students, and recent expansion of learning communities within different engineering programs. The career fair was a mutually developed event with DMACC staff and faculty arranging transportation for the students, and ISU's College of Engineering staff and faculty preparing a customized experience for these community college students: campus tours, networking luncheons, presentations by faculty and career fair sponsors, interaction with potential engineering employers, and individual ISU engineering advisor meetings. Currently ISU's College of Engineering is expanding their learning communities to incorporate the needs of transfer students.

Enhancing connections

The learning village is conceptualized around a visionary centerpiece that includes both ISU's learning communities' model and the recently launched Admissions Partnership Program (APP). Now known as Engineering Admissions Partnership Program (E-APP), it is a hybrid built specifically around the needs of community college pre-engineering transfer students. The program application requires a minimum grade point for acceptance, and upon acceptance includes ISU student services such as advising, obtaining a student identification card and email account, access to graduation planner software, and invitations to campus activities such as the ISU engineering career fair. The two additional features provided to pre-engineering students participating in E-APP include: an assigned peer mentor and participation in the Facebook student social network. In addition to this, DMACC Learning Village Team members are working to develop a learning community for pre-engineering students at the Ankeny campus, beginning with a cohort of students enrolled in chemistry and physics courses. This will provide a direct connection to the learning community with ISU's College of Engineering, and assist in a smooth transfer and transition process.

The key to the roll out of the E-APP program will be the development of marketing materials, which currently include a brochure and poster. Included in the brochure are, not only the benefits of E-APP, but testimonials from students who have successfully transferred from a community college pre-engineering program to ISU's College of Engineering. The marketing material is scheduled to be launched in February 2009, beginning with DMACC's Ankeny campus, and continuing to other DMACC locations during 2009 spring semester. The peer mentors will be visiting specific classes on DMACC campuses to provide information on the E-APP program, and also allowing the pre-engineering students to understand who they are, and what they have to offer the students. The Learning Village Team will be working to ensure these visits will be focused on STEM courses at DMACC, and will allow peer mentors to explain the benefits of the E-APP program.

Measuring Impact

Through use of our Logic Model, the Learning Village Team has developed both quantitative and qualitative data to determine the impact of our activities. The results of this combination plan of assessment will inform future activities and modifications to our plans. Essentially, we have incorporated a Deming-like model of quality improvement or Plan-Do-Study-Act as the basis for assessment. Our team is currently in the process of gathering data to assess and evaluate progress of our activities. Preliminary indications show that our team is positively impacting pre-engineering transfer students' success by providing services under the E-APP umbrella. However the team is currently in the process of obtaining both quantitative as well as qualitative data to understand our impact on connecting students to ISU's College of Engineering. In designing our assessment program, the team initially determined the need to establish a baseline upon which to measure progress quantitatively over time in the following areas: E-APP enrollment, E-APP student v. non E-APP student performance, EGR 100 enrollment, demographics, transfer plans completed, social network participation, career fair attendance, and ISU graduation plans completed. In utilizing qualitative assessment, the team determined that focus groups with students in the EGR 100 course would be the basis for an initial determination of progress. Preliminary results from the fall 2008 focus group indicate that ISU advising within the APP program was valuable in transfer planning, and that the EGR 100 course successfully provided

information that assisted students in understanding the resources available to them both at ISU and at DMACC. The Learning Village Team is also in the process of developing and administering a pre and post-survey of community college transfer students within ISU's College of Engineering. These surveys are designed to determine initial perceptions within the first semester of transfer, and then to be reflective after the completion of their first semester at ISU. Both the pre and post-surveys are projected to be implemented in March 2009 as a joint effort between members of the SEEC Learning Village O-Team and Advising O-Team.

Conclusion

We are looking forward to determining our impact on pre-engineering transfer students, and based on preliminary evidence we are beginning to see indications of success. We hope to collect and analyze all data during spring 2009 semester with the assistance of the Evaluation O-Team. This will allow our team to see the results of utilizing a holistic approach to create connections between community college pre-engineering students and ISU's College of Engineering. These results will be used to inform continued program development in order to achieve SEEC's ultimate goal of increasing engineering graduates from ISU. We are SEECing to provide America with the talent needed to ensure a brighter and more secure economic future.

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