

A Department-wide Approach to Student Success Based on Ecological Validation

Dr. Deepak R Keshwani, University of Nebraska, Lincoln

Dr. Deepak Keshwani is an associate professor and Director of Undergraduate Programs in the Department of Biological Systems Engineering at the University of Nebraska-Lincoln. He also serves as a Faculty Fellow for Student Success in the College of Agricultural Sciences and Natural Resources. In addition to teaching and advising both undergraduate and graduate students, Deepak the AG futures learning community in leadership, service, and civic engagement.

Dr. Jennifer Keshwani, University of Nebraska, Lincoln

Jenny Keshwani is an Associate Professor of Biological Systems Engineering and Science Literacy Specialist in the Institute of Agriculture and Natural Resources at the University of Nebraska-Lincoln. She is active in promoting science and engineering education.

Logan Ryan Newman, University of Nebraska, Lincoln

Rachel Ibach, University of Nebraska - Lincoln

Taryn King, University of Nebraska, Lincoln

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Abstract

Over the past two years, the Biological Systems Engineering Department at the University of Nebraska-Lincoln has embarked on a department-wide transformation of advising and retention practices to support undergraduate student success. The department has three undergraduate majors across two different colleges. The motivation for the transformation included rapidly changing advising systems and processes at the institutional level, institutional goals for retention and graduation rates, faculty, and staff desire to enhance student belongingness in the department, and increased faculty-staff partnership. The theoretical framework used for the transformation was the ecological validation model designed to foster student success by focusing on the strengths, needs, and experiences of students. The model is based on seven behavioral norms and was conceptualized from a longitudinal study of a scholar's program at three different universities in the state of Nebraska. A department faculty member was part of a multi-year institutional professional learning community (PLC) that explored the scale-up and scale-out of this model. Based on their experience from the PLC, this model was used in the development of the department's overall student services ethos and in the specific implementation of two initiatives: 1) hybrid advising/mentoring model, and 2) peer-mentoring program. This practice paper provides an overview of the ecological validation model and presents our approach to implementing these initiatives. We also reflect on challenges and future opportunities including long-term sustainability and assessment opportunities.

Introduction

There is an increasing focus on student success across higher educational institutions, particularly in North America. This has resulted in numerous student success initiatives that span curricular, co-curricular, and student life. Our university, like many other public institutions of higher education, has strong campus-level student success programs and initiatives that have resulted in documented success such as increased rates of minority student graduation [1]. One of the key initiatives that has transformed the student success culture at our institution has been the William H Thompson Scholars Program designed to support students from low socioeconomic backgrounds [2]. This program has been in place across three universities of varying sizes across the state of Nebraska. A longitudinal study of this program resulted in the development of an asset-based approach to support students, called PASS - Promoting-At-Promise Student Success [3]. An at-promise student is defined as a student who have historically been underserved by institutions and traditionally viewed through a deficit lens as at-risk students [4].

As a department, we decided to collectively invest in learning from this approach and use it to transform our approach to student success. The decision was driven by several factors:

1. An increased campus-level focus on retention and graduation rates has resulted in the rapid deployment of new advising and student success platforms that faculty and staff who were advising were expected to use. A majority of faculty in our department who

were engaged in academic advising expressed concerns about the time commitments needed to learn and use these systems.

2. With the hiring of three professional staff members in the department to support undergraduate programs, the department wanted to be more intentional about fostering a partnership approach between faculty and staff to support students. Faculty in particular wanted to stay engaged with students but relinquish day-to-day advising responsibilities.
3. A focus on building community and enhancing belongingness among students in our department. Our student population spans three different majors across two colleges. These student populations share similarities, but also have distinct differences in the challenges they perceive and the support they need [5], [6]. The demographics of our student populations continue to evolve, and we are observing more at-promise students entering our program,
4. We were seeing significant drops in student retention within the major for two of our academic programs. Those drops pre-dated COVID-19 and were only exacerbated during that time. Anecdotal evidence from advisers and students leaving the program indicates that reasons for the loss in retention include challenges with math and science courses, and lack of interest in the major.

The goals of this *practice paper* are to provide a brief overview of the ecological validation model, which is the framework of PASS approach, and how that was used to guide department student success strategies.

Overview of Department

Our department has three undergraduate degree programs. Biological Systems Engineering (BE) and Agricultural Engineering (AE) are offered through the College of Engineering and the Agricultural Systems Technology (AST) is offered through the College of Agricultural Sciences and Natural Resources. Table 1 provides information on enrollment, and percentage of students that would be considered at-promise students. It is worth noting that there are additional categories of at-promise students, but our institutional processes currently do not capture information about all categories. Additionally, while we adopted practices designed for at-promise students, they were designed to support all our students.

Table 1. Enrollment and at-promise demographic overview of department's student population.

Major	Enrollment (as of Fall 2023)	% Low Socioeconomic Background	% First generation	% Under-represented minorities (URM)
BE	165	13	15	8
AE	35	37	25	-
AST	53	41	28	-

The department has a student services team consisting of two professional advisers who also support academic operations and a recruitment coordinator. This team is led by a faculty member who serves as Director of Undergraduate Programs. Additionally, the department developed a

student success committee focused on recruitment, retention, and professional development of our students. Out of twenty-five faculty with undergraduate teaching responsibilities, fifteen are directly involved in advising and/or mentoring of undergraduate students.

The Ecological Validation Model

As previously mentioned, the ecological validation model was developed based on a multi-year longitudinal study of a scholar’s programs across three different university settings. Once the model was conceptualized, each of those universities created a professional learning community (PLC) consisting of faculty, staff, and administrators with backgrounds and interests in student success. The goals of the PLC were to learn about the ecological validation model and implement initiatives to scale up and scale out across. A faculty member in our department was selected for our institution’s PLC resulting in the adoption of this model for our department’s student success approach. The underlying rationale driving the ecological validation model is that *how* student success programs are created and delivered is more important than *what* the actual programs are; yet the “how” is often ignored. For example, tutoring is a great resource for students, but how that resource is presented and where it takes place impacts whether or not students consider utilizing those resources. Hallet et al. highlight the importance of fundamental changes in structures and processes as a key attribute of impactful student success initiatives [7]. Their work summarizes that a common theme of successful programs is an intentional focus on creating a culture of ecological validation. For the purposes of this paper, we use the following terminology:

- Norms: implicit or explicit behaviors or practices that are expected or observed
- Ecological: pertaining to interactions between students and their environment
- Validation: explicit interest and recognition of a student and their assets

The ecological validation model centers on the intentional development and use of norms by validating agents that include faculty, staff, and peers. A description of the norms is provided in Table 2 and Figure 1 shows how this model is conceptualized in the context of our academic department. Students experience the university supported by these validation agents.

Table 2. Summary of norms associated with validation agents (adapted from Hallet et al.[7])

<i>Norm</i>	<i>Description</i>
Holistic	Consideration of all needs of the student (academic, personal, professional)
Proactive	Early engagement and building of relationships, and development of success strategies before students present challenges
Strengths-oriented	Intentional focus on assets, talents, and previous successes of the student
Identity conscious	Awareness and consideration of identities and interests of students and tailoring strategies accordingly
Developmental	Cohesive and consistent support along a student’s journey
Collaborative	Building and sustaining relationships between validating agents
Reflective	Utilization of formal and informal data to evaluate approaches and make changes

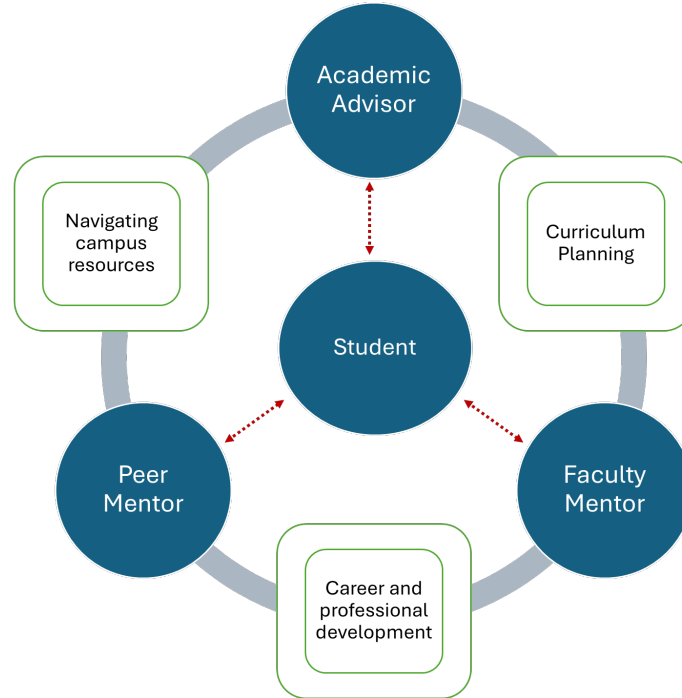


Figure 1. The ecology of validation model for student success as conceptualized in the department.

While there is considerably more to share about the ecological validation model, we chose to focus on the norms in this paper and utilize those when developing department-level initiatives. In the subsequent sections, we will describe two student success initiatives and will highlight how these norms show up in the development and implementation of these initiatives.

Initiative 1: Hybrid Advising/Mentoring Model

Prior model:

Our prior model of advising was primarily focused on academic issues and varied across the three majors. In the BE program, students were advised by one of two professional academic advisors for the first two years, after which a student is professionally admitted to the program (college policy). At this time, the students were assigned new advisers who were faculty based on their chosen emphasis areas representing their career interests who would then advise them through graduation. In the AE program, students were advised by a faculty adviser for the first two years. Following professional admission, AE students were assigned to other faculty advisers based on their chosen emphasis areas.

In the AST program, students were assigned to multiple faculty who advised them from entry to graduation. AST students reported positive feedback to having the same adviser throughout the program highlighting the importance of the *cohesive norm* in academic advising. However, not all AST advisers had the bandwidth to learn and use the new advising and student success platforms that were introduced at the campus level. These platforms were designed to foster

proactive advising and required a high level of engagement and awareness of campus resources and processes to support students. In the AE and BE programs, students struggled with the abrupt transition as evidenced by continued engagement with their pre-professional advisers which drastically limited them from benefiting from engaging with faculty who have expertise in their interest areas. Faculty advisers also struggled with adapting to the new advising and student success platforms.

New model:

Our new approach uses a hybrid advising/mentoring model that utilizes both professional staff and faculty in very intentional ways. We started by identifying the range of student needs and mapped those to roles/responsibilities of two categories of validating agents: adviser and faculty mentor (Table 3). In doing so, we considered student needs *holistically* and made sure those needs were being met by at least one validating agent. The department student advisory board was engaged in needs identification.

In this approach, students are assigned a dedicated adviser who remains with them throughout the duration of the degree program and are assigned a faculty mentor later. The mentor assignment typically coincides with the professional admission process for the AE and BE students but can happen earlier if the adviser feels like the student can benefit from early faculty engagement. In the AST program, the mentor assignments happen in semester 4 coinciding with completion of a required cornerstone class that has career exploration aspects. This model takes an intentional *developmental* approach where advisers first help students acclimate to the college environment, focus on building trust, and then introducing a faculty mentor focused on career and professional mentoring. The students benefit from in-depth advising expertise as well as the disciplinary expertise of faculty mentors.

This approach does require mutual recognition and respect between faculty and staff and is based on a framework proposed by Frerichs and Keshwani [8]. We created an expectation of information sharing between validating agents reflecting the *collaborative norm*. Each validation agent has explicit expectations for training and professional development that fosters *reflective practice*. When we first introduced this model, we intentionally did not preclude faculty from participating as advisers. Out of the fifteen faculty previously involved in academic advising, two chose to engage in the new model as advisers. The remaining thirteen chose to be faculty mentors.

A third element of this advising/mentoring model was the use of the Student Service Team and the Student Success Committee. The student services team (consisting of three staff members and Faculty Director of Undergraduate Programs) meets weekly to discuss issues reported by faculty mentors or from interactions with students, review information related to student success such as advising touch points, retention data, registration data, academic probation, and campus deadlines. The student services team is also responsible for *proactively* identifying students who may need specific academic and campus support services or proactively engage advisers to support students. This weekly touch point fosters constant *reflection* on available data resulting in specific interventions with students, messaging to faculty mentors, and guidance to the BSE Student Success Committee which is tasked with developing specific programs and initiatives for student success. Collectively, this has created a more *collaborative* culture.

Table 1. Roles and responsibilities of advisers and mentors to meet student needs.

	Adviser	Faculty Mentor
Frequency of interaction	2-3 times a semester	Once a semester
Responsibilities	<ul style="list-style-type: none"> • Degree planning and course requirements • Academic success coaching • Academic forms and procedures • Referral and engagement with campus support services 	<ul style="list-style-type: none"> • Selection of upper-level engineering and science electives • Guidance on career pathways and experiential learning
Expectations for training and professional development	<ul style="list-style-type: none"> • Attending all campus and college level student success and advising training • Lead and participate in department level training on student success • Maintain expertise in advising approaches, student development strategies, and campus advising and student success platforms • Awareness of the broader curriculum and sequence of courses. 	<ul style="list-style-type: none"> • Participation in department level training on student success • Maintain awareness of the discipline and industry trends specific to the major and emphasis area • Awareness of upper-level elective courses related to the major and emphasis area.
Documentation requirements	Utilize campus advising platforms to record advising interactions and outreach to students	Email summary of interactions with students to adviser and students.

Initiative 2: Peer-mentoring program.

During the 2023-2024 academic year, we piloted a peer-mentoring program designed to engage a third type of validation agent, a peer-mentor to support all incoming first-year students.

The program pairs upper-class mentors with first-year students. We have 12 mentors who each have 5-6 mentees who they meet with regularly during the semester. The goal of the program is for incoming students to transition to college with advice from upper-class students and help them create an *identity* as members of the department. Peer-culture has been shown to positively influence student outcomes and support identity development [9]. This influence can potentially

be stronger than that of staff or faculty. Due to time constraints, staff and faculty cannot always meet with every student or help with every challenge a student may face. Peer mentors can potentially view challenges through the lens of a student in the department and can provide a solution that staff or faculty may have missed. It is also an excellent strategy to *proactively* identify student concerns as the mentors share their observations with the faculty and staff who coordinate the program. This is informal data that can be used to *reflect* on how students are experiencing our programs.

Mentor selection and assignment:

For the pilot year, we picked mentors from all three majors based on criteria of academic success and involvement in department or university activities. It was crucial to make sure all majors were represented since our students have very strong identities connected to their majors in comparison to the department. Our goal was to develop a collective identity as members of the department with the hope that would increase the sense of belonging for all our students, particularly the AST students who feel out of place in an engineering department. Mentees were grouped into mentoring teams based on schedule in addition to ensuring that at least two of any particular major were in a team, and at least two of any gender were in a team reflecting an *identity conscious* strategy. Mentors picked their mentoring teams based on schedule and gender representation. Students were spread out between the mentors with different majors. This was done in the hopes that students could meet a range of students with different majors and see more of what the department offers. It is worth noting that peer-mentors were in paid positions during training as well as during implementation.

Mentor training:

Over the summer prior to the start of the academic year, peer-mentors went through training facilitated by a faculty member with experience in managing peer-mentoring programs. The training included monthly synchronous meetings led by members of the student success committee. Each meeting focused on a different aspect of mentoring. The peer-mentors collectively read and discussed “*Belong*”, a book by Radha Agrawal that provided mentors an opportunity for self-discovery as well as strategies to engage others to build community. In retrospect, we should have more intentionally introduced the ecological validation model in the training.

Mentor-mentee engagement:

The format of the mentor/mentee meetings was a mix of group and individual meetings. On top of that each month there was a planned social event for all the mentors and mentees. Outside of the large group socials, mentors met with mentees individually or in small groups. Mentors were able to meet with their mentees when and where that worked best for them. Meetings took place in many different locations ranging from our department building to all over campus and off-campus. Part of this was intentional to provide mentees some ownership in defining the circumstances of the interaction based on their interests and environments they felt comfortable in, reflecting both *strengths-oriented* and *identity conscious* norms.

Mentors would share concerns with each other and solicit ideas to help mentees. Mentors also meet with the faculty and staff managing the program three times a semester. Regular touchpoints between mentors also help identify common struggles students were having. For

example, the first-year chemistry course was a source of anxiety for many students. This helped mentors *proactively* point students to resources. This information helped the Student Services Team align resources to offer free tutoring services for first-year students within the department. Mentors also reported checking in with students who fell sick and helping them navigate absences. This is an example of how the program is helping us support students *holistically*.

One thing we saw in the mentor and leadership team meetings was the mentors discussing how to best help their mentees. A BE mentor would ask an AST mentor for advice about classes or labs that they could take back to their AST mentees. They were able to share mentor engagement strategies, topics to discuss, and even share ideas for issues that a student may be facing that they have never thought of before. The meetings provided a *collaborative* environment for mentors and fostered engagement across the three majors.

Google Sheets was utilized to track and log interactions to monitor student participation. While participation in the mentoring program was not required, the instructors of the introductory courses in each of the three majors emphasized the importance at the start of the semester and incorporated a small portion of the class grade to participation in mentoring. For example, the instructor of the AST introductory course asked students to write a short reflection on their participation in the mentoring program. The BE introductory course has specific points allocated based on participation in the program. In retrospect, some consistency across the courses would have been preferable. Feedback from peer-mentors also highlighted the importance of a more structured implementation of the peer-mentoring program within the context of the introductory courses.

Reflections and next steps

The two initiatives presented in this paper are the first attempts in our department to utilize the ecological validation model to intentionally guide student success efforts in our department. Currently, the language of the ecological validation model is shared primarily by the Student Services Team and some members of the Student Success Committee. To fully realize the potential of these initiatives, we need to engage the broader group of faculty, staff, and peer mentors and equip them with an understanding of the model and associated behaviors of validation agents. In collaboration with the campus PLC, we are working on curating training resources related to the ecology of validation model.

The first cohort of students to experience the new hybrid advising/mentoring model started in the fall of 2022 and are just now engaging with faculty mentors. We plan to use our exit surveys to gauge student reaction to the new model and compare results from surveys of previous cohorts. We are also navigating some institutional limitations on how nomenclature related to advisers and mentors. Currently, in our student information systems, there exists definitive roles for advisers that can be mapped and connected to students. However, there is no category for faculty mentors. Hence, in official student records, there is no connection between the student and faculty mentors. We are working with our institution's registrar's office to use our department's advising model as a pilot to create an official faculty member role in the student information system.

The peer mentoring program is still underway as of the submission of this paper. We plan to collect survey data at the end of the academic year from both mentors and mentees on strategies to enhance the program the following year. Some changes that we already plan to make include an expanded training program that includes the ecology of validation, and consistent and direct connections between the mentoring program and the first-year introductory courses. We also want to examine the impact of peer-mentoring on the peer-mentors themselves from a student development perspective.

It should be noted that initiatives based on ecology of validation requires establishing mutual trust and respect between professional advising staff and faculty given the emphasis on collaboration. While power dynamics are always present and can lead to a disconnect between faculty and staff [10], it can be mitigated by intentional efforts such as co-leadership of faculty and staff on committees, which is what we did in the case of our student success committee. We also elevated messaging around the profession of academic advising and student affairs to our faculty during monthly faculty meetings.

Adding peer-mentors to ecosystem requires additional intentionality around equipping the students well to be mentors and providing them space to co-create the mentoring program. The latter is important as student co-creation has the potential to foster innovation in co-curricular initiatives that benefit student personal and professional development [11].

A final reflection is on resources, both tangible and intangible. Yes, these initiatives do consume time, energy, and money. The pilot of the peer-mentoring program cost about \$12,000 in addition to faculty and staff time in managing the program. Development and implementation of the new advising model required literature research, stakeholder engagement, and facilitating training workshops. It is crucial for any department considering such initiatives to first identify and cultivate faculty and/or staff champions to lead these initiatives and align their position descriptions to reflect these activities. Our department addressed this by first creating a Director of Undergraduate programs position (25% of a faculty member's apportionment) whose job responsibilities included leading student success initiatives. Strategic hiring of professional staff in student-centered roles provided the necessary advising capacity for implementing these initiatives.

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