



Decoding Transitions to College

Crossing the High School/College Frontier

REBECCA C. ITOW, DAVID PACE, TARA DARCY, DEREK CHASTAIN, JAHLEA DOUGLAS,
WILLIAM ROBISON & MICHAEL BEAM

Abstract

This article presents the *Decoding Transitions to College* initiative, which aims to bridge the gap between high school and college through collaborative approaches. The program brings together high school and college educators to identify and address disciplinary learning bottlenecks that students face during the transition to higher education. The project was developed and refined using a design-based implementation research approach. Over multiple iterations, educators from both educational levels engaged in structured dialogues in two subjects per cohort, based on the *Decoding the Disciplines* method. The objective was to analyze learning challenges, uncover implicit expert knowledge, and develop strategies to support students in overcoming these obstacles. The article highlights the professional development activities of the participating educators and presents two specific learning bottlenecks alongside their solutions. By innovatively applying the *Decoding the Disciplines* approach in this collaboration, its potential to enhance teaching practices beyond higher education is clearly demonstrated.

Keywords: Decoding the Disciplines; pedagogy; transition to college; bottlenecks; biology

Entschlüsselung der Übergänge zur Hochschule:

Lernhürden an der Grenze von Schule und Hochschule

Zusammenfassung

Dieser Artikel stellt die Initiative Decoding Transitions to College vor, die darauf abzielt, die Grenze zwischen High School und College durch kooperative Ansätze zu überwinden. Im Rahmen des Programms werden Lehrkräfte aus High Schools und Colleges zusammengebracht, um fachliche Lernhürden zu identifizieren und zu bearbeiten, die Schüler:innen beim Übergang zur Hochschule begegnen. Das Projekt wurde im Rahmen eines designbasierten Implementierungsforschungsansatzes entwickelt und verfeinert. In mehreren Iterationen traten Lehrende beider Bildungsstufen in jeweils zwei Fächern pro Kohorte in den Dialog, basierend auf der Methode Decoding the Disciplines. Ziel war es, Lernhürden zu analysieren, implizites Expertenwissen offenzulegen und Strategien zu entwickeln, um Schüler:innen bei der Überwindung dieser Herausforderungen zu unterstützen. Der Artikel beleuchtet die Kompetenzentwicklungsmaßnahmen der beteiligten Lehrkräfte und stellt

zwei spezifische Lernhürden sowie deren Lösungen vor. Durch die innovative Nutzung des Ansatzes Decoding the Disciplines in dieser Kollaboration zeigt sich dessen Fruchtbarkeit für die Weiterentwicklung von Lehre über die Hochschule hinaus.

Schlüsselwörter: Decoding the Disciplines; Didaktik; Übergang zur Hochschule; Lernhürden; Biologie

1 Introduction

The Decoding the Disciplines approach to enhancing student learning has spread across the globe, in large part because the basic paradigm can be adapted to respond to a great variety of challenges (<https://decodingthedisциплиnes.org/>; Middendorf & Pace, 2004; Middendorf & Shopkow, 2023; Pace, 2021; Pace & Middendorf, 2004). Yet the field and the larger scholarship of teaching and learning (SoTL) community have shared a self-imposed restriction that has limited its potential impact on the world of education; Decoding work tends to occur in post-secondary settings, and it can seem challenging to cross the high school/college frontier.

This paper describes one effort to cross that frontier. Decoding Transitions to College is both a program and a commitment: the program brings high school and college faculty together to share practices and unearth assumptions that could illuminate our understandings of the bottlenecks students face when transitioning to college. Our commitment is revealed in the active voice of our work’s title: Decoding Transitions to College is an ongoing effort to Decode – or break down into its parts – the challenges that persistently prevent students from experiencing a smooth transition to college. In this work we position students’ scholastic experience as a continuous arc of learning from kindergarten to college. Doing so has revealed specific transition-to-college bottlenecks, highlighted which skills are reasonable to expect in new college students, and invited high school teachers to use Decoding as a tool for improving their teaching.

From the outset, we aimed to involve the perspectives of as many central stakeholders as possible in our effort to understand the hurdles students encounter as they leave high school and enter a post-secondary environment. Across the leadership team, co-investigators, and participants, we ensured that administrative, student, and faculty voices actively contributed to every aspect of Decoding Transitions to College. The authorship of this paper is no exception. Table 1 describes the authors’ roles and relevant experience to illustrate this point.

Table 1: Author Roles and Relevant Experience

Author	Initials	Decoding Transitions to College Role	Experience
Rebecca C. Itow	RCI	Research Team Leader	High school principal; university executive leadership; former secondary school teacher
David Pace	DP	Research Team Leader	A co-founder of Decoding; Emeritus Professor of History
Tara Darcy	TD	Decoding Transition to College Fellow	Senior Lecturer in Biology; Director of Undergraduate Environmental Studies, Integrated Program in the Environment
Derek Chastain	DC	Decoding Transition to College Fellow	High school biology teacher; college biology instructor
Jahlea Douglas	JD	Student Co-Investigator (2023–2024; 2024–2025)	Undergraduate student; academic coaching intern; current master’s student in mental health counseling; high school assistant advisor

(Continuing table 1)

Author	Initials	Decoding Transitions to College Role	Experience
William Robison	WR	Student Co-Investigator (2022–2023)	Undergraduate student; academic coaching intern; current high school teacher
Michael Beam	MB	Research Team Lead	University executive leadership; former secondary school teacher; former secondary school administrator

Together, these stakeholders – as well as the other faculty participants – ensured that our exploration of the transition to college bottlenecks was informed by relevant voices.

Through five years of iterative Design-Based Implementation Research (DBIR; Fishman et al., 2013; Penuel et al., 2011) cycles, we developed a professional development (PD) structure that leverages “bottlenecks” in teaching (Pace & Middendorf, 2004) and the Decoding interview to engage educators in refinement of their pedagogical practices. We then used this PD structure with high school and college educators to explore what bottlenecks may be preventing students from transitioning to college smoothly. These research cycles generated three major outcomes:

- a. a Decoding-focused sustained PD structure for exploring the transition to college;
- b. valuable cross-level and cross-discipline dialogue; and
- c. identification of three bottlenecks to the transition to college.

This article describes the structure of the Decoding-focused PD in the context of an effort to better understand the transition to college, how that PD supported high school and college educators in responding to pedagogical challenges by increasing communication between teachers in the two systems, and the bottlenecks to transitioning to college that were revealed. It closes with a discussion of how this work may evolve as we apply our learnings to practice.

2 Context

The work described in this article grew out of a concern with the number of students experiencing difficulty in introductory college courses – and in the transition to college more generally – as indicated by high drop, fail, and withdrawal (DFW) rates. Efforts to address DFW rates in introductory college courses are a priority both in U. S. research institutions broadly (Boyer 2030 Commission, 2022) and in the strategic plan of the university where this work was conducted. Author MB (university executive leadership) called RCI (a high school principal) and DP (a college professor) together to discuss this priority, and the resulting discussion made it clear that simply increasing communication between the two levels of educators may at least expose hidden assumptions and at best may offer insights for smoothing students’ experiences in first-year college courses. Because of Decoding’s strengths in promoting productive and disciplinary discourse (Engle, 2012) between diverse faculty, Decoding became the framework on which this work was built.

To identify and address transition-to-college bottlenecks (places where students tend to get “stuck”), we developed a program that framed student learning as a continuous journey from secondary through post-secondary education and recruited faculty from both sides of this “frontier” to share their experiences. Doing so highlighted differences in the training, institutional structures, and pedagogical practices across the two school levels. For example, in the United States, public high school teachers’ training includes a focus on child development and domain pedagogy, while university faculty training is often focused on field-specific expertise (Baker, 2024). US public high schools tend to have a rigid bell schedule that tells students when to move, eat, and care for themselves, while universities expect students to manage their time and behaviors independently.

2.1 Decoding with Secondary School Educators

Decoding (Middendorf & Pace, 2004; Middendorf & Shopkow, 2023; Pace, 2021; Pace & Middendorf, 2004) leads educators through a process of identifying “bottlenecks” to learning or places in courses where students tend to “get stuck;” making explicit what students need to do to be able to get past these obstacles; and modeling, giving practice on, and assessing the targeted skills. Decoding as a process helps educators move beyond content and focuses their attention on the pedagogical decisions and moves an educator makes as they teach that content.

The Decoding interview has been a powerful tool for finding common ground as faculty inspect their teaching practices. In this process, a teacher identifies a place in one of their courses where significant numbers of students are unable to successfully complete essential tasks. Then the interviewers help the interviewee make the steps that students must follow to overcome this bottleneck explicit (Middendorf & Shopkow, 2023, 36–63; Pace, 2017, 32–53). Miller-Young and Boman (2017) found that when groups of teachers conduct Decoding interviews with each other, they develop a common understanding of the challenges that each face and a shared language for talking about teaching. This work, as well as the successful use of Decoding with preservice teachers at the elementary and secondary school levels (e.g., Díaz & Shopkow, 2017; Lovin & Schultz, 2012; McBrady, 2022) convinced us that Decoding with high school and college educators would likely reveal important insights around the transition to college.

2.2 Decoding Transitions to College

The first design cycle of this work began in 2020 as schools – and the planet – were figuring out how to keep students learning during the COVID-19 pandemic. To help teachers learn to teach online and build pedagogically sound virtual courses, RCI and MB launched a series of webinars, a graduate course, and a major state-funded online Course Design Academy. As part of this effort, middle and high school teachers engaged in the Decoding interview.

A second design cycle of the same model demonstrated that secondary school teachers had no difficulty identifying crucial bottlenecks in their courses, and responded to the Decoding interviews with the same level of commitment and insight that we had encountered at the college level. A middle school English teacher, for example, articulated the complex steps of choosing an appropriate personal experience for a personal narrative essay. A high school math teacher dissected the shifts in students’ visualization processes when moving from geometry to trigonometry. It seemed that Decoding could support faculty across institutional levels as they inspected their own teaching. We therefore developed a sustained professional development experience that brought high school and college faculty together to Decode Transitions to College.

The third design cycle was titled Decoding Transitions to College, and was launched in spring of 2022. The directors of the program, RCI and DP, worked with an undergraduate student co-investigator (WR) to recruit sixteen dedicated biology and Spanish faculty, half from high school and half from college, as Fellows in the program (including TD and DC).

The fourth design cycle occurred in a second year of Decoding Transitions to College in 2023. This cycle used the same structures as the year prior, and invited educators from Chemistry and English to participate. A new student co-investigator, JD, joined the team.

The fifth design cycle in 2024 brought participants from the first two years of the Decoding Transitions to College program (design cycles 3 and 4) together. These educators designed professional development opportunities that could be delivered in their school contexts in a very limited time-frame. They then implemented their designs, introducing Decoding to a new set of audiences. Designs included a pamphlet on Decoding, worksheets and guides to find and address a bottleneck, a one-hour workshop for high school faculty on interviews and bottlenecks, conference presentations, an asynchronous virtual course using Decoding to support peer review among teachers at both the high school and university levels, and a department-wide high school PD series implementing the Decoding Transitions to College framework through regular Professional Learning Community meetings across the school year.

3 Method

This work occurred in five iterative design cycles from 2020–2025 with the four principles of Design-Based Implementation Research (DBIR; Fishman et al., 2013; Penuel et al., 2011):

1. **DBIR Principle 1: Teams form around a focus on persistent problems of practice from multiple stakeholders' perspectives.** Based on the Boyer 2030 Commission Report, the university strategic plan, and discussions with various stakeholders, RCI, DP, and MB identified this work's persistent problem of practice as the consistent struggles – or bottlenecks – that students experience during the transition to college, as evidenced by high DFW rates and first-year student retention rates. Each year of the project, the co-investigating team consisted of a high school principal (RCI), an emeritus professor (DP), undergraduate researchers and program assistants who worked with at-risk and first-year college students (WR and JD), and a member of university executive leadership (MB in 2022–2023; RCI in 2024–2025). Together, these stakeholders identified and recruited college and high school faculty in specific domains as project participants (represented by authors TD and DC), designed & implemented Decoding Transitions to College workshops, and made iterative refinements both within and across design cycles.
2. **DBIR Principle 2: To improve practice, teams commit to iterative, collaborative design.** Following the initial work in 2020, RCI, DP, and MB committed to engaging in several cycles of design and refined implementation of the workshop series. Each year, the team examined participant interaction within and across workshops to respond to participant needs and in pursuit of a finer understanding of specific bottlenecks to the transition to college.
3. **DBIR Principle 3: As a strategy for promoting quality in the research and development process, teams develop theory related to both classroom learning and implementation through systematic inquiry.** Decoding provided a systematic framework that guided the development and implementation of Decoding Transitions to College as well as individual participant engagement. At a broad scale, the Decoding steps helped us to develop an understanding of the challenge as well as to identify a general structure and starting point for the workshops. The Decoding steps also supported faculty in the difficult and vulnerable work of collaboratively inspecting their own teaching practice and identifying places for improvement (i. e., bottlenecks). Participant feedback and experience directly informed design and implementation at each stage.
4. **DBIR Principle 4: Design-Based Implementation Research is concerned with developing capacity for sustaining change in systems.** This work aimed to increase capacity within secondary schools and university departments to support students as they prepare for and embark on the transition to college. We did so by developing PD structures that use the Decoding framework to ease the flow of communication across institutional levels.

3.1 Recruitment of Participants

Program participants – called Fellows – were recruited by recommendation. Each iteration of the program involved 16 educators, with eight in each discipline. Of those eight, four were from the university level, and four were from the high school level. To begin recruitment, first we identified university departments that (a) teach first-year courses with (b) high DFW rates, and (c) have corresponding courses at the high school level. For example, university introductory biology had high DFW rates and biology is a required course at the secondary school level. We then worked with departments to identify university faculty who teach those introductory courses and consistently demonstrate a commitment to teaching. Recommended participants were then interviewed to determine selection.

Many of those college faculty chosen to be Fellows in the program had been involved in the university's dual credit program¹. These faculty recommended high school teacher participants who would help them think deeply about the high school-college transition. Other high school teachers were recruited from design cycles 1–2's Course Design Academy.

3.2 Student Voices

Given that our ultimate goal was to understand and improve the transition to college, it was important that student voices were included in our research as well. Prior to the first year of the program, we interviewed students in introductory Spanish and biology courses regarding their experience in transitioning to college. We then shared excerpts from these interviews with the Decoding Transitions to College Fellows. The student narratives focused the Fellows on viewing their courses from a student's perspective, and made the differences in students' preparation for college across school systems with varying access to resources painfully visible.

We were unable to repeat these student interviews during the second year of the program; however, during both years, our student co-investigators (JD and WR) took part in all of the summer meetings and frequently contributed information about their own experiences.

4 Results

Decoding Transitions to College resulted in three major outcomes that offer concrete PD structures, practical guidance, and clear examples of how bottlenecks and the interview process can facilitate cross-disciplinary and cross-level dialogue that informs research.

4.1 Decoding-Focused Sustained Professional Development Structure

The first major outcome of the Decoding Transitions to College work is a refined professional development structure that uses the Decoding framework to support sustained learning in community. The PD occurred over a full year on this timeline:

- Asynchronous week of introductions to each other and Decoding content (early summer)
- Synchronous two-day workshop to commune and further explore the Decoding steps and experience (Step 1) Defining a Bottleneck and (Step 2) Uncovering the Mental Task (early summer)
- Semi-synchronous interviews, pedagogical discussion, and curricular strategy development (1–2 summer months)
- Asynchronous implementation and refinement, leaning on community as needed (academic year)
- Synchronous one-day meeting to share experiences (spring)

Within this timeline, we designed and implemented these structural components of the PD:

1. *In stakeholder teams, identify a persistent problem of practice.* In this work, the persistent problem of practice was understanding the transition-to-college bottlenecks that prevent students from achieving in introductory courses. The bottlenecks identified were, in themselves, deeply rooted persistent problems of practice as well.
2. *Convene stakeholder participants with practical expertise from varied fields and institutional levels.* We gathered administrators, researchers, faculty, and students with expertise in how people learn at secondary and post-secondary institutions to explore the transition to college collaboratively. Each participant (including the research team leaders) cared deeply about improving teaching and learning.

¹ The university's dual credit program offers introductory college courses in high schools. University faculty design the course and train teachers to deliver it to students at their local high schools, where students can earn high school and college credit simultaneously.

3. *Build community.* Before discussing bottlenecks or Decoding, we started with the human, inviting participants to share their professional experiences and goals. We worked under the notion that before we can engage in the hard work of learning, we work to create an environment in which participants feel safe, supported, and connected to one another (Kennedy, 2023; Fig. 1).

3-part Brain & What We Need to Heal

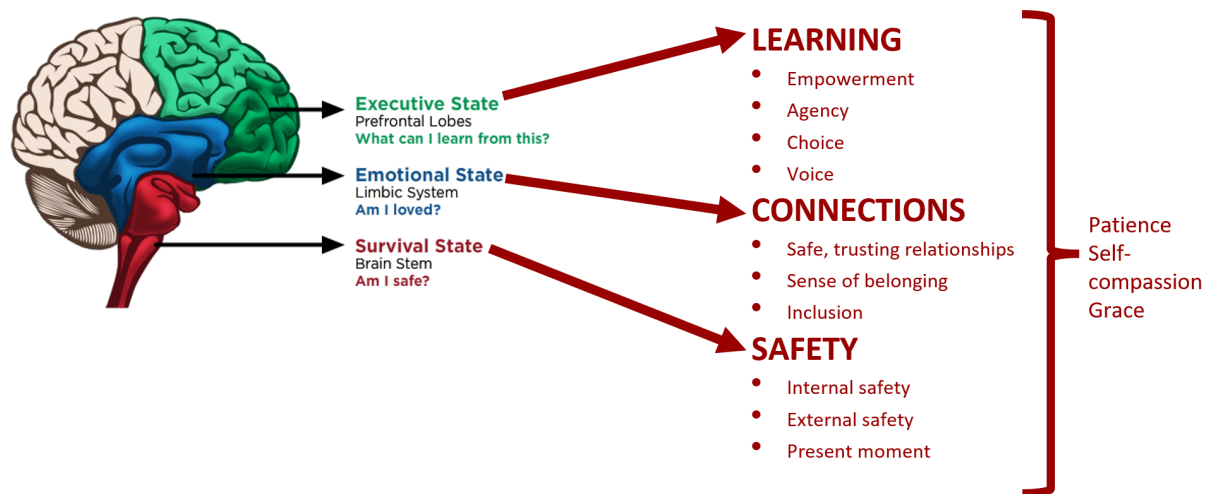


Figure 1: 3-Part Brain & What We Need to Heal (Kennedy, 2023; image reprinted with permission)

4. *Introduce bottlenecks through a Decoding interview and debrief.* Only after the group became familiar with one another did we introduce Decoding. After a brief introduction, we invited volunteer interviewees and interviewers to model how to identify a bottleneck. Conducting an interview with spontaneous volunteers helped to demonstrate both how to search for a bottleneck, and that one can identify a challenge in their teaching without diminishing themselves as a professional or a human.
5. *Discuss pedagogy and practice in cross-disciplinary/cross-level teams.* Once the large group interviews were complete, cross-disciplinary and cross-level teams of four rotated through the interview roles (interviewee, interviewers, scribe) until every participant had assumed each role. As they did so, participants began unearthing bottlenecks, identifying their common themes, and noting unique characteristics.
6. *Develop cross-cutting curricular strategies in interdisciplinary/cross-level teams and individually.* With bottlenecks defined, participants gathered in interdisciplinary/cross-level teams to brainstorm and develop cross-cutting curricular strategies that address a specific curricular issue and can be applied within domains and across levels.
7. *Implement, gather feedback, refine, repeat.* Individual educators then implemented their designs in classrooms, gathered feedback and collected work from students, refined their strategies, and repeated the cycle until they were satisfied with the results.
8. *Share experiences and student responses.* All stakeholders gathered to share their experiences, push on each other's thinking, and learn from one another. Participants identified similarities in implementation and discussed further refinements as a group.
9. *Analyze and apply results to persistent problem of practice.* The group's insights then informed our understanding of the bottlenecks for transitioning to college.

4.2 Fruitful Dialogue

A second major outcome of this work is the valuable cross-level and cross-discipline dialogue that focused on pedagogical refinement within course contexts.

4.2.1 High School Biology Example

DC, a high school biology teacher, found that his participation in Decoding Transitions to College fundamentally reshaped his pedagogical thinking. His interview revealed that students were omitting crucial steps when visualizing concepts in three dimensions, and DC realized that this was because parts of the process were missing in his instructions. DC shared that “After the Decoding [interview] process, I realized that this is more of a visualization problem. I am trying to train these students to think like a biologist and to visualize or imagine in three dimensions. I am now aware that there is a lot more involved, that there are a lot more steps in my mind.” DC began to carefully cover each step and increase opportunities to receive feedback from students.

DC was also inspired to refine his strategies by a phrase that had become a kind of mantra for Fellows in his discipline – “Biology is not a spectator sport.” DC realized that the polished PowerPoint presentations he had developed might not be working because they allowed the students to remain passive “spectators” in the learning process. Therefore, DC replaced some of the presentations with active-learning exercises involving work on the board, making cardboard cutouts, and crafting pipe-cleaner models. He showed the students how to model the phenomena being described in lectures as a way to articulate the concepts being learned. DC developed a classroom culture in which students were encouraged to ask more questions, and this helped him better recognize when students were encountering bottlenecks. He also administered questionnaires to better understand how students were integrating the learning procedures that he was modeling into their study practices.

4.2.2 College Biology Example

A second pathway through the Decoding process was charted by TD, an instructor in the Biology department at the university. She began her Decoding interview by expressing her dismay that many of her students were having difficulty interpreting graphs that seemed quite obvious to her. However, after throwing herself into the process, TD dissected the process into a complex series of subtasks and realized that what she was expecting of students could actually be quite demanding for novice learners.

Recognizing that this step was essential for her students’ success in the course, TD identified three stages that were required for success at the task of understanding a graph in an introductory biology course: orientation (e. g., identifying independent and dependent variables), pattern recognition (e. g., describing the shape of the function-linear/non-linear; increasing/decreasing), and interpretation (e. g., why the function was changing in this way; identifying intercepts or equilibria; and connecting it to relevant biological concepts). Each time a new graph was introduced, TD guided the class through each subtask in a “graphing checklist” that she developed from her engagement with the Fellows, allowing the students to answer some of the questions on their own while ensuring they had the correct interpretation by the time they left the class. The students could use these checklists on homework and online quizzes or even apply the subtasks to graphs encountered in other science classes. In a survey of 297 students, 78.5 % of them indicated that the graphing checklist tool had been valuable for their learning (Darcy, 2025).

4.2.3 More Examples of Pedagogical Change

There are numerous examples of similar specific initiatives that the Fellows undertook in their courses as a direct response to their participation in Decoding Transitions to College. Several Fellows indicated that they were now focused on the need to be “more transparent” in all of their interactions with students. One Fellow restructured homework assignments to more clearly model and give prac-

tice on key mental operations. Many Fellows collaboratively developed strategies for modeling note-taking, and one Fellow had students peer-review their classmates' notes. Another restructured a course so that each week they focused on a bottleneck.

4.3 Transition-to-College Bottlenecks

A third major outcome of Decoding Transitions to College is the identification of three bottlenecks first-year students experience when struggling with the transition to college. At the conclusion of the 2023–2024 iteration of Decoding Transitions to College, Fellows from both cohorts were invited to return to share how their teaching had continued to evolve, and to build relationships across cohorts. In addition to presenting specific interventions designed to help students master particular skills, the two cohorts articulated three broader bottlenecks to the transition to college, which will be a focus of future work:

1. Becoming an independent learner and trusting oneself and others
2. Exhibiting professionalism and executing time-management skills
3. Engaging in practices that promote motivation, persistence, and resilience

In each of these bottlenecks, the Fellows identified specific behaviors that need to be consciously modeled for students in the learning environment before and after the transition to college.

5 Discussion

Equally indicative of the impact of this work were the Fellows' reflections on the how their teaching changed as a result of Decoding Transitions to College. The Fellows' general reactions to Decoding were overwhelmingly positive. Both the high school and the college faculty volunteered terms like "super helpful," or "mentally charged." Another commented that she "wasn't really expecting to get such great ideas ... I had a project. I thought I knew what I was doing and then I got these fantastic ideas that have worked so well."

5.1 Impact of Cross-Discipline and Cross-Level Insights

During a 2024 meeting with the Fellows, several commented on the ways that working with people outside their disciplines led to new and often unexpected insights. A chemistry professor, for example, commented on how much the process of interacting with the high school English teachers had given her important insights into what made her subject difficult for many students. Another college faculty member stressed the importance of "finding out what was ... different between what they're doing at the high school level and the college level." In a group discussion, a Spanish professor made connections between her students' struggle with language and those articulated by a high school chemistry teacher.

Perhaps what was even more striking was the fact that so many of these high school and college faculty spontaneously reported that the program had fundamentally transformed their teaching. This is particularly significant because this was a group of educators who had been selected because of their years of experience in the classroom and their effectiveness as instructors. The term "holistic" was used repeatedly to describe the impact of the program. Fellows described the approach as "a whole new state of mind. . . a [new] thought process in terms of everything that I present." One fellow reported that Decoding had changed "my teaching in a way that I didn't expect." Another described the approach as a process that now "overarches" everything. One high school teacher noted that in addition to the planned applications of the approach, there were often "accidental" occasions in which Decoding allowed her to respond to challenges that emerged unexpectedly in a different way than she might have before. Yet another said that she took away "a different philosophy, where I'm becoming more myself as a teacher." And many of the Fellows indicated that they were changing their teaching strategies, not only in the courses they had targeted in the program, but in others as well.

5.2 Considerations for Sharing Decoding Rapidly

At the conclusion of the 2023–2024 workshop, participants made clear that, while they want to share both the strategies they developed and the Decoding framework itself with their colleagues, they are unsure how to do so in the time-limited settings available in their individual institutions. Additionally, concerns were expressed about how receptive their peers might be to this process, given that the Decoding Transitions to College participants were selected by recommendation and based on their likely receptivity to this type of personally vulnerable work.

In response to these Fellows' requests for tools to share the investigative techniques they have learned with their local colleagues, the next cycle (design cycle 5) was refined to engage returning Fellows in developing "mini workshops" that can be deployed in 45-minute or one-hour sessions (described in Section 2 above). Fellows designed professional development experiences and resources that offer tools for supporting the kind of pedagogical exploration that they found so helpful without requiring significant external, time, or financial resources. In this way, Decoding Transitions to College simultaneously works to further build capacity within secondary schools and university departments while continuing to explore bottlenecks to the transition to college.

6 Conclusion

Many of the Decoding Transitions to College Fellows have commented that the focus on bottlenecks to learning had become a central element of their pedagogies. One noted that "... spending time on that one bottleneck early in the course has really reaped tremendous benefits that I couldn't predict down the line." Bottlenecks have permeated the Fellows' consciousness to such an extent that, when one of them commented that she now saw her relationships with her husband and her children through a bottleneck lens, many of the other Fellows indicated that the same was happening in their lives. One of the college chemistry teachers, for example, created special "Bottlenecks Friday" sections of her course to help students with difficult challenges. When another Fellow had made two crucial bottlenecks the focus in all sections of a course and all assignments throughout the semester, she was surprised to find the number of "A"s achieved by her students that year had increased by 9% over the previous year.

Such responses, in addition to the quality of the interviews, the effective collaborations across disciplines and across the high school/college frontier, the production of new course activities and assignments, and the willingness of the Fellows to share what they have learned with others outside the program, provide ample evidence that the basic elements and structures of Decoding Transitions to College are sound. The focus on bottlenecks and the Decoding interview process provided both a stimulus to major pedagogical innovation as well as a framework for communication between educators at the two levels. These may prove crucial in smoothing the transition from high school to college courses.

Furthermore, the use of Decoding to bring high school and college faculty together has empowered educators at both levels; throughout the workshops, Fellows have shared that they see their teaching and themselves in a new light because of the relationships they built in this program, that their colleagues and administration are impressed with their work, and that their relationships with students have improved. Several Fellows have integrated Decoding into other, more advanced courses, and some have used what they learned to initiate new projects at the university. The research team leaders, too, have found that the insights gleaned from engaging multiple stakeholders in our exploration of the transition to college have impacted the shape of our research and program development. The model developed in Decoding Transitions to College opens up an entirely new horizon for the application of Decoding and for the scholarship of teaching and learning more broadly. It can play a major role in our efforts to provide students with the preparation they need to succeed in our educational systems and in their lives beyond.

Gratitude note

The work described here is the result of collaborative efforts from all of the Decoding Transitions to College Fellows. We are grateful for the Fellows' work to decode transitions to college, and appreciate the time and expertise they have shared to move this effort forward.

Literature

- Baker, N. R. (2024). The Impact of Learning How to Teach for College Professors. *Journal of Effective Teaching in Higher Education*, 7(1), 118–132. <https://doi.org/10.36021/jethe.v7i1.325>
- Boyer 2030 Commission (2022). The equity/excellence imperative: A 2030 blueprint for undergraduate education at U. S. research universities. *The Association for Undergraduate Education at Research Universities*.
- Darcy, T. (2025). Application of the Decoding the Disciplines Paradigm to Enhance Graphical Interpretation by Introductory Biology University Students. *die hochschullehre* Jahrgang 11/2025.
- Díaz, A. J., & Shopkow, L. (2017). A tale of two thresholds. *Practice and Evidence of the Scholarship of Teaching and Learning in Higher Education*, 12(2), 229–248.
- Engle, R. A. (2012). The productive disciplinary engagement framework: Origins, key concepts, and developments. In D. Dai (Ed.) (Ed.), *Design research on learning and thinking in educational settings* (pp. 170–209). Routledge.
- Fishman, B. J., Penuel, W. R., Allen, A.-R., Cheng, B. H., & Sabelli, N. (2013). Design-Based Implementation Research: An emerging model for transforming the relationship of research and practice. *Teachers College Record*, 115(14). <https://doi.org/10.1177/016146811311501415>
- Kennedy, K. (2023). *The Mind-Body Connection for Educators: Intentional Movement for Wellness*. John Wiley & Sons.
- Lovin, L., & Schultz, K. (2012). Illuminating mathematics teacher education through decoding disciplinary thinking: unpacking mathematical knowledge for teaching. In J. R. Young, L. B. Ericksen & S. Pinnegar (Eds.), *Extending inquiry communities: Illuminating teacher education through self-study* (pp. 183–187).
- McBrady, J. (2022). Decoding the Disciplines as a pedagogy of teacher education. *Teaching & Learning Inquiry*, 10. <https://eric.ed.gov/?id=EJ1340399> <https://doi.org/10.20343/teachlearninginqu.10.11>
- Middendorf, J., & Pace, D. (2004). Future of decoding the disciplines. *New Directions for Teaching and Learning*, 2004(98), 109–110. <https://doi.org/10.1002/tl.152>
- Middendorf, J., & Shopkow, L. (2023). *Overcoming student learning bottlenecks: Decode the critical thinking of your discipline*. Taylor & Francis.
- Miller-Young, J., & Boman, J. (2017). Using the Decoding. The Disciplines Framework for Learning Across the Disciplines. [Special Issue] *New Directions for Teaching and Learning*, Number 150. John Wiley & Sons. <https://doi.org/10.1002/tl.20241>
- Pace, D. (2017). *The decoding the disciplines paradigm: Seven steps to increased student learning*. Indiana University Press. <https://doi.org/10.2307/j.ctt2005z1w>
- Pace, D. (2021). Beyond Decoding the Disciplines 1.0: New Directions for the Paradigm. *Teaching & Learning Inquiry*, 9(2). <https://doi.org/10.20343/teachlearninginqu.9.2.3>
- Pace, D., & Middendorf, J. (Eds.). (2004). Decoding the disciplines: Helping students learn disciplinary ways of thinking. *New Directions for Teaching and Learning*, 2004(98), 1–12. <https://doi.org/10.1002/tl.142>
- Penuel, W. R., Fishman, B. J., Haugan Cheng, B., & Sabelli, N. (2011). Organizing research and development at the intersection of learning, implementation, and design. *Educational Researcher*, 40(7), 331–337. <https://doi.org/10.3102/0013189X11421826>

Authors

Dr. Rebecca C. Itow. Indiana University, Bloomington, IN USA; Orcid-ID: 0000-0001-8847-5542; E-Mail: rcitow@iu.edu

Dr. David Pace. Indiana University, Bloomington, IN USA; E-Mail: dpace@iu.edu

Tara Darcy. Indiana University, Bloomington, IN USA; E-Mail: tldarcy@iu.edu

Derek Chastain. Columbus East High School, Columbus, IN USA and Indiana University, Bloomington, IN USA; E-Mail: chastaind@bcsc.k12.in.us

Jahlea Douglas; Indiana University, Bloomington, IN USA; E-Mail: jahdoug@iu.edu

William Robison; Victory College Prep High School, Indianapolis, IN USA; E-Mail: william.c.robison@gmail.com

Dr. Michael Beam; Indiana University, Bloomington, IN USA; E-Mail: mibeam@iu.edu



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