Achieving the Dream™

INTEGRATING ADAPTIVE TOOLS INTO COURSE REDESIGN

A CASE STUDY OF AMARILLO COLLEGE

everylearner everywhere

JANUARY 2022

ABOUT THIS CASE STUDY

Achieving the Dream (ATD) is one of 12 higher education and digital learning organizations that make up the Every Learner Everywhere (Every Learner) Network, whose mission is to help higher education institutions improve and ensure more equitable student outcomes through advances in digital learning, particularly among poverty-impacted, racially minoritized, and first-generation students. Every Learner partners are addressing high failure rates in foundational courses through the provision of scalable, high-quality support to colleges and universities seeking to implement adaptive courseware on their campuses. As part of its ongoing effort to help community colleges develop effective teaching and learning practices, ATD is working with seven community colleges in Florida, Ohio, and Texas on this initiative, providing coaching and direct support to the colleges, fostering collaboration within and among the participating institutions, and serving as a liaison to the Every Learner network.

The following case study is part of a series of studies conducted by ATD examining how adaptive courseware is implemented at those institutions as well as how courseware is used in particular disciplines to better serve students. Case studies are based on a series of interviews with college leaders, faculty, instructional designers, developers, technology specialists and students who were enrolled in classes using the courseware.

Acknowledgements

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We would also like to thank ATD Director of Program Development, Dr. Ruanda Garth-McCullough,for leading ATD's Every Learner Everywhere work with the support of ATD staff Susan Adams, Francesca Carpenter, Eric Fiero, Cheryl Fong, Jonathan Iuzzini, Sarah Kinnison, Dr. Richard Sebastian, Dr. Tanya Scott, Paula Talley and Dr. Monica Parrish Trent as well as former ATD staff members, Joanne Anderson, Shauna Davis and Shanah Taylor.

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OVERVIEW

Faculty at Amarillo College led efforts to implement adaptive courseware into redesigns of introductory math, English, and chemistry courses which included corequisite courses in each discipline.

- Adaptive implementation was centered within corequisite support classes paired with college-level courses as part of broader course redesigns in several disciplines.
- Faculty efforts were supported by the college's Center for Teaching and Learning, which provided instructional design support and integrated adaptive technology into faculty learning cohorts.
- Amarillo College worked with adaptive publishers to develop new courseware focused on adult learners and GED requirements; career and technical programs also are exploring the use of the technology.
- While success of initial efforts varied across disciplines, Amarillo plans to include adaptive courseware as one potential component of future course redesigns.

SUPPORTING INSTITUTIONAL REFORM

The Every Learner initiative supports broader efforts to foster student learning with evidence-based practices, including efforts to support the development of students' mastery of concepts and critical thinking skills. "Every Learner Everywhere allowed us to transition away from the 'traditional' model of learning," says President Dr. Russell Lowery-Hart. The initiative also reflects the contexts in which broader institutional reform is taking place at community colleges throughout the ATD Network, including building a culture of excellence in teaching and learning and leveraging data and technology to support student success and equitable student outcomes. To learn more, see p.8.

AMARILLO COLLEGE
DATA SNAPSHOT[1]

LOCATION Amarillo, TX

TYPE City

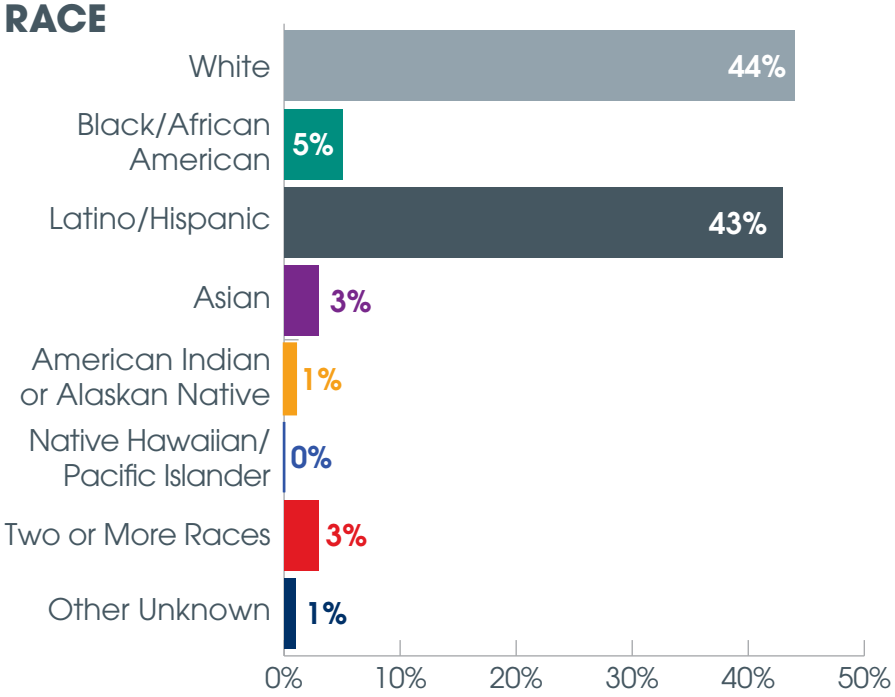
LOCATIONS (Campus/Centers) 7

ENROLLMENT
9,739

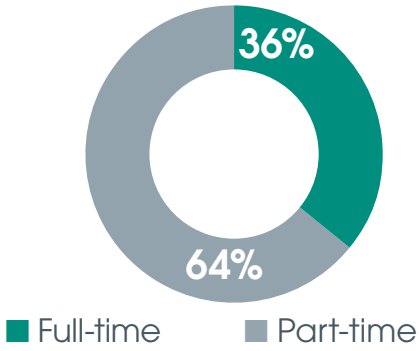
GENDER
FEMALE **65%**

MALE **35%**

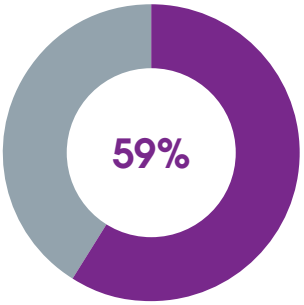
RACE



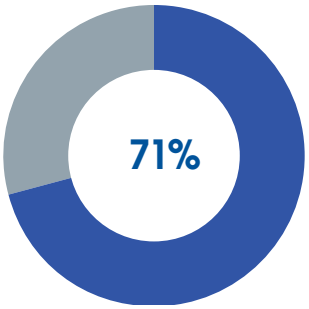
Full-time vs. Part-time



Pell-grant recipients



First-generation



(of students receiving financial aid)

ATD MEMBER STATUS

JOINED ATD
2011

ATD ACHIEVEMENTS
ATD Leader College (2014)
ATD Leader College with Distinction (2018)
Leah Meyer Austin Award Winner (2019)

1 The information contained in the Data Snapshot is based on data from the National Center for Education Statistics' College Navigator, data collected directly from the institution and information maintained by ATD.

AMARILLO COLLEGE

ELE INFORMATION						
Discipline	**Courses**	**Sections**	**Students**	**Full-time Faculty**	**Adjunct Faculty**	**Courseware**
Chemistry	Introductory Chemistry I (CHEM 1305)	7	185	4	0	Knewton Alta (Wiley)
	General Organic & Biological Chemistry (CHEM 1406)	2	85	2	0	Knewton Alta (Wiley)
	Principles of Chemistry I (CHEM 1311)	5	115	3	0	Knewton Alta (Wiley)
	Principles of Chemistry II (CHEM 1312)	5	115	3	0	Knewton Alta (Wiley)
English	Composition I (ENGL 1301)	20	~500	4	3	InQuizitive (W.W. Norton and Company)
	Composition II (ENGL 1302)	12	300	6	1	InQuizitive (W.W. Norton and Company)
Math	College HSE Math (MATH 0303)	10	250	4	3	MyLab Math (Pearson)
	College Algebra for STEM Majors (MATH 1414)	5	111	3	0	MyLab Math (Pearson)
	College Algebra (MATH 1314)	14	~400	7	0	MyLab Math (Pearson)
	Business Math (MATH 1350)	2	58	1	0	MyLab Math (Pearson)
	Contemporary Math (MATH 1332)	9	260	3	0	MyLab Math (Pearson)

INTRODUCTION

Ashley Landrum didn't go to college after graduating high school for many reasons, but one stands out. "I didn't think I could pass a math class," she says.

Now 26 and a mother of two, she is in the second year of a nuclear medicine program at Amarillo College. Placed in an eight-week corequisite college algebra course when she first enrolled, she used adaptive courseware in the supplemental math course that immediately followed the algebra class.

That course—and the accompanying adaptive homework included in the corequisite redesign—was intended to help students like Landrum "do the extra work to build the skills to know for algebra," she says. "They were really trying to teach us the basics to get everybody on the same playing field."

LEVELING THE PLAYING FIELD

Amarillo College's longstanding commitment to meeting academic and nonacademic student needs and eliminating barriers to completion that has been summarized by Lowery-Hart as "loving (students) to success." Amarillo faculty and staff use similar language to describe the potential benefit of adaptive courseware, which they see as a powerful tool to support the college's diverse student populations.

"Students come to the community college from such different backgrounds and skillsets," says Dean of STEM Edie Carter, formerly Amarillo's dean of academic success. "Adaptive brought to us something we could explore that allows students to own their learning…. and to help who we've been missing."

Efforts to implement adaptive courseware were supported through the college's Center for Teaching and Learning (CTL), providing participating faculty access to three instructional designers and additional supports through ongoing cohorts focused on different elements of course redesign, including the use of technology as well as curriculum, data-informed instruction, and student engagement.

CTL staff saw adaptive technology as a way to support faculty considering moving towards a robust flipped learning model in which student work within courseware would inform classroom activities, according to Becky K. Burton, associate vice president of academic affairs. "Students would use it outside of class, and faculty would get the information and data that comes from it to drive their instruction and hands-on learning experiences," says CTL Director Dr. Lori Petty, who as an instructional designer supported the implementation of adaptive courseware.

BUILDING ON ATD'S CORNERSTONES OF EXCELLENCE

Like other community colleges participating in the Every Learner Everywhere grant which are part of the ATD Network, Amarillo College has committed to engaging in bold, holistic, and sustainable institutional change across multiple institutional areas and priorities. The institution's efforts to implement adaptive courseware reflect the importance of several key cornerstones of institutional change, including building a culture of excellence in teaching and learning and leveraging data and technology to support student success and equitable student outcomes. "Adaptive courseware allowed us to effectively integrate and elevate technology to flip our classrooms, extend learning well beyond class times, and support students more robustly," says President Dr. Russell Lowery-Hart.

ATD's Institutional Capacity Framework and Institutional Capacity Assessment Tool (ICAT) outlines seven essential institutional capacities required to create a student- focused culture that promotes student success. One focuses specifically on teaching and learning and the commitment to engaging full-time and adjunct faculty in examinations of pedagogy, meaningful professional development, and a central role for faculty as change agents within the institution. Building capacity in this area is particularly crucial because, as ATD President Dr. Karen A. Stout recently asserted, "focusing on teaching and learning is still not central to the field's overall theory of change. We still have much more to do to build a deep focus on pedagogy and to support our colleges in building a culture of teaching and learning excellence."

To foster this culture of teaching and learning excellence, *ATD's Teaching & Learning Toolkit: A Research-Based Guide to Building a Culture of Teaching & Learning Excellence* is centered on four cornerstones of excellence that provide a forward-looking vision that campuses can use to inform their work.

Initiatives such as Every Learner provide important supports to community colleges and the time, space, support, and resources to explore innovative pedagogical approaches to improve student learning and outcomes. They also offer sustained opportunities to build on these cornerstones of excellence. Amarillo College's work with the initiative exemplifies the importance of institutional efforts to empower faculty to consider, adapt, test, and refine new approaches to fit their campus context and the needs of their students, including efforts to ground adaptive courseware within broader course redesign efforts.

This commitment builds on broader efforts to integrate and scale technology in ways that support evidence-based instructional practices that foster student learning, including using students' needs that surface during adaptive work to "build your face-to-face instruction with students… rather than having it already planned," says Dr. Lori Petty, director of the college's Center for Teaching and Learning.

The Every Learner Everywhere grant also provided faculty with opportunities for professional learning that supported ongoing improvements in pedagogy, including flipped classroom models. "You have to have support for faculty—people who understand instructional design, technology, and what a good, student-centered classroom looks like," says Becky K. Burton, associate vice president of academic affairs.

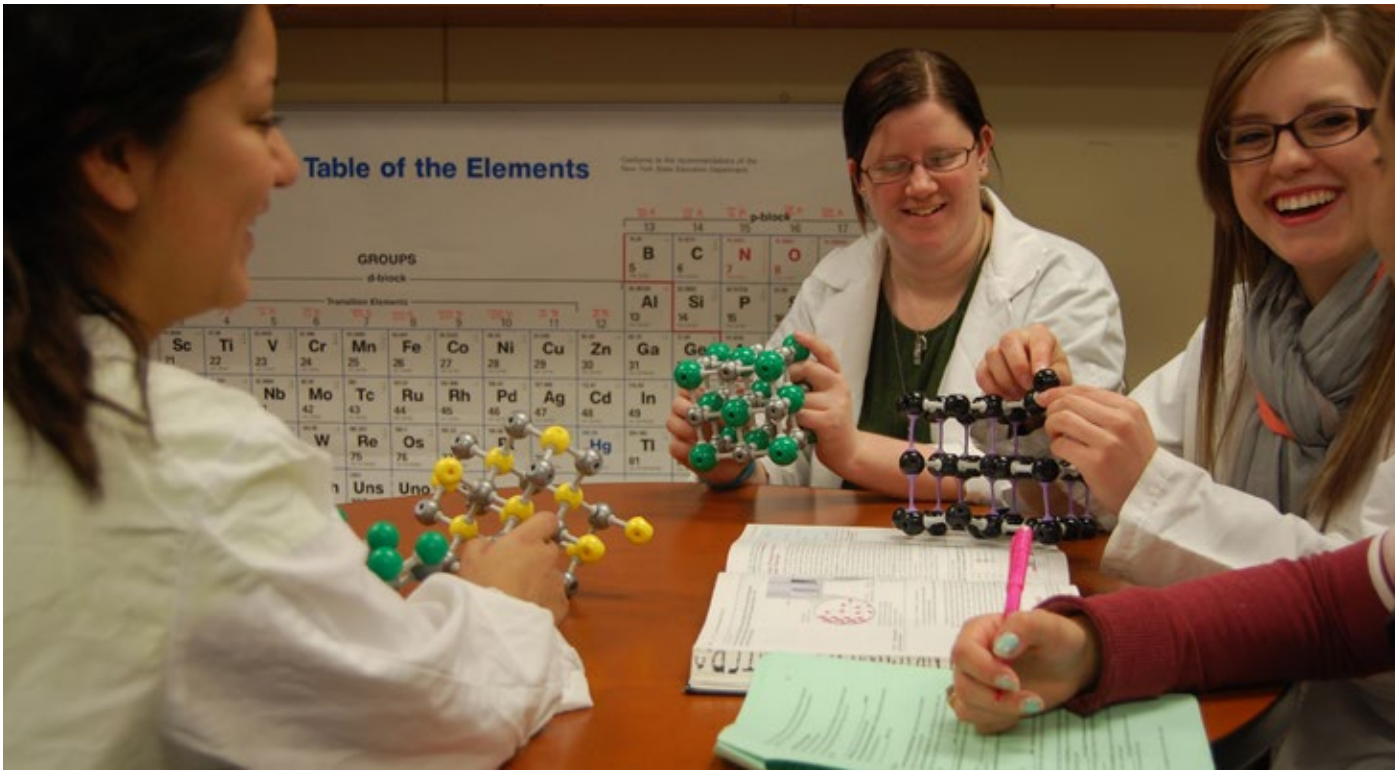
REDESIGN ACROSS DISCIPLINES

Several departments were already involved in shifting introductory courses to a fully corequisite model in which credit-bearing transfer courses were paired with support classes, and Every Learner Everywhere efforts ultimately focused on disciplines where faculty already were engaged in these course redesign efforts "and wanted to explore more," Burton says.

Math faculty, for example, were creating corequisite courses in four key pathways to better support students entering Amarillo with differing levels of skill. Because adaptive was considered in the midst of the redesign, math faculty selected a program that students had already used in the college's Contemporary Math course for familiarity and cost reasons.

In chemistry, faculty were seeking more cost-effective options for students who struggled with traditional online homework. The department had been piloting an adaptive homework model before the Every Learner Everywhere initiative and joined the campus-wide effort, which provided access to CTL's instructional designers, according to Burton.

Across disciplines, adaptive courseware was envisioned as providing extra support for students in the developmental corequisite component of the paired courses, an approach that largely bore out in practice. Chemistry faculty found most questions offered within the software were "appropriate for our students," says Associate Professor Dr. Jennifer Rabson. "Occasionally I need to suggest an (alternate) question when something's too difficult."



One challenge, Rabson says, has been supporting students with limited science skills by scaffolding the steps to solving complex problems. Overall, though, "students doing the extra work accepted they need it," Rabson says. "The biggest problem was the ones who never warmed up to it or decided they weren't going to do the (adaptive) homework. They may just be individual students who never got fully committed to the class."

Faculty members believe that adaptive courseware helped engagement in chemistry more than any other subject because of its support of the broader course redesign. "Students were able to spend more hands-on lab time in the classroom (rather) than doing a bunch of lectures," according to Petty.

THE STUDENT EXPERIENCE

For Katie Cisneros, having her job as a dental insurance coordinator outsourced to a third-party company was the impetus to return to college. "I thought what better way to start over and pursue a career?" she says.

A corequisite support class for English composition included adaptive homework that built on the grammar they learned in class. "The adaptive helped me out at times," Cisneros says. "I think I was successful in freshman comp because of that."

Amarillo students were exposed to adaptive courseware as part of their overall experiences with corequisite support courses in English, math, and chemistry. Their perceptions of the technology tended to mirror the extent to which supplemental courses supported their work in the college-level transfer classes, which in turn was largely influenced by whether the same professor taught both courses.

While Cisneros found the English support course—taught by the same instructor as comp—extremely helpful, Ashley Landrum found a similar supplemental course for college algebra with a different faculty member less so. "It almost felt like they were two separate classes," she says. Adaptive work tended to be inconsistent: "It was confusing, and if it was more synced up, it would have been helpful," she adds.

Cisneros says that faculty support was what made adaptive coursework so effective for her and her classmates. "The courseware is just another reinforcement for me," she says. Her professor "would ask us how the homework was last night, and after hearing everybody's issues, she went through and discussed all the issues we had. It all comes down to the professor. She'd stay after the class and go over with us to get us to believe that we could do it."

SUPPORTS FOR ENGLISH AND GED STUDENTS

Amarillo College was one of a relatively small number of institutions within the Every Learner cohort which explored using adaptive courseware in English—and it may be the first to adapt it for use to support adult learners seeking their GEDs.

As in other disciplines, integrated reading and writing courses were shifted to a corequisite model to better support the wide range of student needs, including the college's significant number of multiple language learners.

"We knew we're bringing in students who are at very low levels (of English proficiency)," says English professor Carol Summers. "We had to do something, and this fell into our laps."

The department brought together all reading and writing instructors and several faculty members who taught subsequent classes which required the integrated course to focus on adoption. They ultimately decided to focus adaptive work on grammar, as college-level faculty "wanted us to develop the skills for basic writing," Summers says.

In-person classes featured brief lessons on grammar concepts, which were reinforced by work in adaptive courseware at home. However, only the students who came close to passing their entrance exams were asked to work in the courseware daily, according to Summers. One student completely finished the adaptive program by mid-semester, she says, while others took longer to complete individual assignments or required reteaching of selected concepts. Even so, students across all skill levels found adaptive courseware engaging.

"Students enjoyed using it, whether it was five minutes or an hour," Summers says.

At the same time, adult education instructors worked with the courseware developer to fill a gap—the lack of adaptive products focused on GED programs. "We provided them with our curriculum and the Texas GED standards, and they created our course for us," says Dr. Teresa Gaus-Bowling, curriculum specialist. The goal, she says, was to give students with stronger skills the opportunity to move more quickly through the program.

"Our curriculum was one on top of each other, but quite a few of our students didn't need it to be that slow," says Gaus-Bowling. "Adaptive really filled that gap."

Importantly, not all adult students were given adaptive work. Faculty identified those who were "bored in the classroom, knew how to do the basic stuff, and had a plan and wanted to get in and out" of the program, Gaus-Bowling says. As terms progressed, faculty also shifted their limited courseware licenses to other students in cases when those originally assigned them never warmed to the technology.

Students who used adaptive coursework found it helpful because "students saw it was integrated" into the curriculum, Carter says. "Given the eight-week terms, it becomes even more important that adaptive becomes embedded and integrated into the course."

What Worked Well:

Engagement. A key rationale for Amarillo's adoption of adaptive courseware, faculty and students often gave the technology high marks for its ability to keep students focused. "This program is almost like a game," says English professor Carol Summers. Chemistry faculty credited the online resources that were part of the coursework, including explanations of questions, links to tutorials for related concepts, and a progress bar that shows students where they are in terms of mastery.

Flexibility. Chemistry faculty said they examined adaptive assignments and decided which ones were appropriate for their students, while math faculty adjusted questions to make them align more closely with transfer course objectives. "Students didn't see it as beneficial until I tweaked it so it matched what we were doing in college algebra," says math instructor Gale Brewer. Dr. Jennifer Rabson, an assistant professor in the physical sciences department, agrees: "It works well if you spell things out exactly and make sure all the content matches," she says.

Students stressed the importance of adaptive courseware supporting the concepts taught in corequisite courses. "To me, it was organized, planned out, and that's what made it so successful," says Cisneros. "At times it can be repetitive, but to me it's extra practice, and more ways to help me believe I can do the work," agreed student Katie Cisneros. Conversely, student Ashley Landrum found the lack of connections between college algebra, the supplemental class, and its adaptive component frustrating.

Identifying struggling students. Faculty credited the technology with identifying both individual students who struggled and which topics large numbers of students struggled with. "It helps us to see how long people are spending on it," Rabson says.

Cost. Adaptive courseware helped address ongoing efforts to reduce costs for materials for students. In English, the courseware was free for students who purchased the textbook—and around $50 for those who didn't. Courseware was $40 per semester in chemistry, and "even so, occasionally we have someone who can't afford the access code," Rabson says. "But it has greatly improved things."

Support for shorter terms. Amarillo used adaptive courseware in courses ranging in length from six-week summer programs to full 16-week terms. Faculty said the software worked well in each setting as long as students were supported in reaching other course objectives. "Adaptive works well either way," Rabson says. "You just have to plan for what you can realistically accomplish with everything else students have going on in their lives."

Ongoing Challenges:

Onboarding. Students reported varying experiences of how they were introduced to adaptive courseware, but stressed the importance of explaining how to work in the courseware early in the term. "Sometimes these programs can be overwhelming, especially if you're not an online learner, which I am not," Landrum says.

Alignment. Some faculty members found that adaptive content didn't align with existing syllabi and objectives. "Rather than trying to force the adaptive (product) to align, they're looking for another one that aligns better," says STEM Dean Edie Carter. Alignment proved particularly challenging in courses using OER textbooks or adaptive courseware developed by a publisher different than the existing textbook, she adds.

Encouraging students of differing levels of ability. "Some students finish in 10 minutes, some work

for three hours," Rabson says. This challenge was compounded by scoring methodologies which push students' grades back as they work through adaptive work. "It's demoralizing," Rabson says. "They shouldn't move backwards to keep morale up for something that's already difficult for most students."

Students also said they found adaptive programs inflexible in how they scored work. "You could put something in the wrong space or not do it 100 percent the way the program wants you to do it, and the program counted it wrong," Landrum says. At times, she adds, "it felt exactly like busy work."

Addressing comfort levels with technology. Especially in adult education programs, some students struggled with using the technology. Others struggled with internet connectivity and had to use PDFs of handouts in the place of interactive materials such as videos.

Recognizing competing pressures in corequisite courses. Amarillo's corequisite model made adapting courseware more challenging in math than in other disciplines, in large part because different instructors taught each of the paired classes. Transfer-level teachers also asked their developmental counterparts not to assign work outside of the classroom, requiring faculty to find sufficient computers in the classroom for students to use. They also opted not to use the courseware in their own courses, "so students didn't see the value, because the transfer course is what gets them to the next level," Burton says.

Landrum agrees that the college-level grade was what students focused on. "I was after that A," she says. "I had a lot at stake."

LESSONS LEARNED

Keys to Amarillo's implementation of adaptive courseware:

- **Identifying engaged faculty.** The college's Center for Teaching and Learning approached faculty in disciplines already working on redesign efforts and those who wanted better access to courseware. "It was knowing our faculty, knowing our departments, and knowing what their needs were," says Becky K. Burton, associate vice president of academic affairs.

- **Recognizing the importance of integrating courseware into broader course design.** "Is it actually embedded into the course, or is it an add on?" asks Dr. Lori Petty, director of the Center for Teaching and Learning. "If you're thinking about adding it into a course, it has to go through redesign. There's no other option."

  A key rationale for integrating courseware into course redesign is supporting faculty as they use data "to build your face-to-face instruction with students around what is happening in adaptive courseware… and drive their instruction rather than having it already planned," Petty says. "That's where course redesign comes in."

  The importance of integrating courseware into broader redesign efforts contributed to challenges faced in some disciplines. Math faculty said one reason they stepped back from adaptive courseware was that it was implemented in the midst of a broader redesign of corequisite courses in four different pathways. "There was probably too much going on," says math instructor Gale Brewer. Conversely, integrating courseware into English was made easier by the single integrated reading/writing pathway in which it was used.

- **Focusing on the students who benefit the most.** Faculty recognized students' lack of familiarity with online courseware, particularly in adult education courses. In those courses, adaptive courseware was targeted at students comfortable with the technology and who continued to use it over the course of the class. "For every recent high school dropout, we also had an older student whose kid was about to graduate from high school and realized they needed their GED," says Dr. Teresa Gaus-Bowling, curriculum specialist. "It's not suited for everybody. It depends on whether students are suited to technology or wary of it. Making it a one-size-fits-all might not have the best intended consequences."

- **Recognizing the importance of addressing student needs.** Resistance to adding adaptive homework was in part a reflection of students' lives. "Most of our students are trying to work full-time hours while taking a full course load and caring for someone at home," says Dr. Jennifer Rabson, assistant professor in physical sciences. "We're trying not to add to that burden."

  In addition, adult programs worked with the college's distance learning coordinator to ensure that each student interested in courseware had internet access and other resources required to access it—including backup plans if their primary internet connection at home was disrupted. "We're trying to meet students where they are," Gaus-Bowling says.

  That's critical, says student Ashley Landrum. "Amarillo has incredible options—computers where we can go work," she says. "But I think about someone in my situation who is a mother working full-time. It's not easy to take your children somewhere to work on coursework."

- **Providing sufficient time for faculty to get accustomed to the technology.** Faculty across disciplines said that more time preparing within the courseware would have helped; adult education teachers only got a week to work within the courseware before starting to use it in courses. "I wound up

working just a little ahead of the students and it worked okay, but I like it better when I can prepare the whole course," says Rabson.

Given ongoing efforts to explore flipped classroom models in some subjects, the need for faculty support was particularly important, according to Petty. Some faculty "had to learn a different way of instruction they haven't thought about as well as adaptive," she says.

- **The value of dedicated faculty support.** The Center for Teaching and Learning provided instructional designers and coordinated faculty cohorts that supported adaptive courseware and broader redesign efforts. "You have to have support for faculty—people who understand instructional design, technology, and what a good, student-centered classroom looks like," Burton says.

CONCLUSION

Participating faculty see adaptive as part of a continuum of academic supports for students that can help keep them engaged in introductory courses. "We wanted to give a developmental education student who comes into college underprepared the toolset that allows them to get up to speed—tutoring, adaptive, and a 1:1 model," Petty says. "We know when it can be implemented correctly, it can be a very valuable tool," Carter adds.

Even so, math faculty ultimately "stepped back" from adaptive, says instructor Gale Brewer, adding that working in courseware during dedicated class time proved challenging.

"In more of a lab setting or self-paced work instead of in the classroom, it would have been beneficial," she says. "It's just not the way our classes were set up."

The experience provided a valuable lesson in terms of ensuring that courseware aligns with course design and structure, particularly given its late inclusion in redesign efforts. Going forward, some math faculty plan to examine other adaptive products for math courses in the future and look carefully to determine if this first attempt faltered because it "wasn't the right adaptive, the right moment, or the right implementation," Burton says.

Given the varied successes of different departmental efforts, Amarillo officials call their experience with adaptive courseware "both sides of the coin." Moving forward, the institution will encourage faculty members to explore adaptive courseware during every new course redesign. Some career and technical programs are exploring the technology, and adaptive courseware is being integrated into faculty cohorts focused on data-informed learning, according to Petty.

"It is an intentional part of redesign at this point," Burton says.

And for Landrum, the technology's use in her corequisite course helped college algebra become "one of the best classes I took at Amarillo," she says. "That surprised me because I thought it wouldn't be for me."

Achieving the Dream™

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