What Influences CS Faculty to Adopt Teaching Practices?

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ABSTRACT
Despite widespread development, research, and dissemination of teaching and curricular practices that improve student retention and learning, faculty often do not adopt them. This paper describes the first findings of a two-part study to improve understanding of adoption of teaching practices and curriculum by computer science faculty. The paper closes with recommendations for designers and developers of teaching innovations hoping to increase their chance of adoption.

Categories and Subject Descriptors
K.3.2 [**Computer and Information Science Education**]

General Terms
Human Factors

Keywords
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1. INTRODUCTION
Retaining students in computer science (CS) is important, not only because of the lifelong benefits to students and the added boon to the U.S. economy, but also because each admitted student represents a substantial investment of time and resources from their departments. Since admissions criteria only rate entry characteristics and not the in-major academic and social experiences shown to better predict retention [3,21,35], a student who leaves is a wasted opportunity for another, potential student.

Women's participation in CS remains a serious problem. In public and not-for-profit private institutions, women were awarded only 13 percent of all CS bachelor's degrees in the U.S. in 2013 [25]. Underrepresentation in computing is a public concern, affecting the availability of an adequate, stable computing workforce, global competitiveness, defense, health, national security, and social justice. Women in CS leave the major more frequently than men despite their high performance [6,19,31,33].

CS educational research shows that teaching and curricular changes could eliminate much attrition, while improving outcomes for all students [1,2,7,15,22]. Despite the wealth of innovative teaching practices that have been demonstrated to retain students, many of those practices are still not known, adopted, or adapted by computer science faculty broadly. We report here on the first phase of a triangulated study of factors that encourage and discourage the adoption of teaching and curricular practices among undergraduate faculty in CS. First, we briefly review literature on adoption, our research methods, and sample profile. We then present results and conclude with recommendations for improving adoption.

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2. SCHOLARSHIP ON ADOPTION
We build on findings from empirical studies and theories of innovation adoption. By *innovation*, we mean a practice or process new to the adopter [32]. In this section, we briefly review literature on the influences on change in teaching practices.

2.1 Organization-Level Research
An organizational context surrounds and influences the individuals who adopt innovative teaching practices. Organizational influences on faculty include organization structure, culture, climate, and reward system [17,34]. Research often faults the higher education reward system as the main barrier to teaching reform [10,24]. In research universities, faculty members who develop and implement teaching innovations do so "at their own risk, [since] these time-consuming projects take faculty members away from … research and publication" [30]. Departmental and institutional cultures and policies may encourage adoption by making risk acceptable. For example, in many institutions, developing excellence in teaching is at least espoused, and sometimes promoted (e.g., [5]). However, a departmental constraint on adoption is the degree to which course content is controlled at the department or higher level [27].

2.2 Individual-Level Characteristics
Individual-level characteristics that influence innovation adoption include awareness of and receptiveness to new ideas; values and attitudes toward certain types of innovations and toward students; pedagogical content knowledge; and perceptions of costs and benefits relative to existing practices [9,18,20,29,36,37]. While CS faculty do not dismiss research evidence about teaching practices, it may not influence their decisions to adopt, as is conventionally assumed [27]. Many faculty members use traditional (i.e., lecture-based) teaching methods because they are familiar, even when they have the opportunity to make changes [37]. Faculty who wish to try out new methods may lack materials for guiding them through successful implementation. Awareness and support alone are not enough to motivate adoption. When considering teaching innovations, most faculty members want to know the benefits for themselves and their students. Another powerful influence on adoption is how faculty conceive of their role as teachers (for a comprehensive review of this literature, see [18]). An assumption often made in education literature is that accomplishing change requires first understanding and changing

existing conceptions about one's role as a teacher, though the assumption that conceptual change precedes, rather than follows, adoption of innovative practices has been challenged [8].

2.3 External Social Networks and Movements

A social discourse [13] comprises all the discussion that goes on in society, including those at conferences, workshops, and in journal articles, letters to the editor, and editorial statements concerning such a theme. In computer science, for example, a 2012 SIGCSE keynote included the example of the "flipped" classroom [4], familiarizing hundreds of CS faculty with the concept. Similarly, pair programming caught on in many departments nationally after the publication of articles in popular venues and "how-to" guides on the subject [23,26,38,39,40]. While not all CS faculty attend educational conferences, those who do may return home with stories to tell about teaching approaches. Few studies have assessed awareness and change caused by trends or communication from social networks [14], yet social discourse about teaching practices may have influence, at least on those predisposed to adopt.

2.4 Framework for the Study of Adoption

We combined the influences of local organizational structure, individual beliefs and characteristics, and the influence of networks into a stage model of adoption, borrowing from Rogers and others [12,32,41]. The adoption process begins with awareness, then implementing, testing, and modifying an innovation. Deciding to make an innovation part of everyday practice is routinization or adoption. Our interview questions focused on awareness, trying practices out, and adopting.

3. RESEARCH METHODS AND SAMPLE

The results presented below are based on interviews and observation conducted with 66 CS faculty members teaching early courses in 36 postsecondary institutions across the U.S. Qualitative methods provide an in-depth understanding of human behavior and the influences of contexts in which it is embedded. The institutions were chosen to represent a diverse set of geographic locations, rankings, and viewpoints, including research universities, all-women, minority-serving, public, private, elite, two-year, four-year liberal arts, and technical institutes. Faculty rank varied from Ph.D. student instructors, part- and full-time teaching faculty to tenure-track faculty and chairs.

Interviews were semi-structured, prompting informants to talk about topics relevant to the framework described in 2.4, but also to express and expand upon what was most salient to them. Interview questions asked faculty to describe their teaching experience and background, number of students in classes, their role as teachers, and motivations for past and present teaching practices. All but eight interviews included a classroom observation. Observations helped interviewers visualize the contexts and practices interviewees described, including student behavior, technology available or used in classrooms, and physical spaces that enable or constrain teaching practices. Moreover, observation illuminated faculty reports of what they do in the classroom, since people do not always remember what they do or why. Also, the words faculty use are often ambiguous. For example, at an engineering school, when asked to reflect on what he had done that day in class, a professor said, "When it's a new concept, like today's, I am just like a traditional teacher. I explain what this concept is. How you can use it." In contrast, the observer noted that the professor began by addressing common misconceptions; related the concept to previous and future course themes; wrote and drew on the board while talking (which gave students time to write it, too); asked students questions, and commented on why an answer was or was not correct; and previewed the courses in which students could learn more about the concept, implying that he believed students were interested, not just that they should know the material. As noted in [18], linking observations to interviews is critical for interpretation. All interviews were recorded and transcribed. Detailed notes of interviews and observations were appended to the transcripts. The authors listened to and read the transcripts multiple times and coded them to identify answers to the questions addressed here.

4. RESULTS

4.1 How do Faculty Hear About Practices?

Motivated to solve a problem. Faculty often intentionally sought out teaching practices because they wanted to solve problems regarding student learning, student engagement, or to increase diversity. An assistant professor in an eastern Hispanic-serving institution sought ideas from her colleagues to improve her students' performance. She said, "For us it's very frustrating to have 50 percent failure rate or passing rate in a core course. We want to make sure that our students are well prepared and succeed in our program." A senior lecturer at a large, private, research school used robots as a "hook" for students with low programming experience, saying that it would "encourage them to spend the time that they need and get the most bang for the buck." On the other hand, a professor at a private liberal arts college who also wanted students to be able to see the results of their programming switched to an all-software environment using Processing, because of unpredictable battery problems of robots.

Many faculty members talked about the desire to increase student engagement, because they felt students were bored or inattentive in class. One adjunct described using jokes and connections to real-world issues for entertainment value. Similarly, a professor at an all-women's college described using examples that were more relevant to students' life experiences, saying, "Everybody has all these Instagrams and things like that, so in that course they actually learn how to manipulate images." In other cases, faculty responded directly to students' explicit comments and suggestions in teaching evaluations and in two cases, students asked professors outright to change the way they taught the course. Both professors subsequently switched from lecture-based teaching to interactive classrooms. Several interviewees identified problems with broader impact on the future of computing, suggesting that lecture-based teaching methods may deter certain groups of students from completing a CS degree.

Awareness through Funded and Institutional Initiatives. Many faculty found out about new teaching practices by participating in initiatives funded by the National Science Foundation, non-governmental foundations, and corporations. For example, an assistant professor at a Hispanic-serving institution went to "CAHSI conferences," funded by the NSF Broadening Participation in Computing program. Integrating a graphics approach into several courses was institutionalized at a southeastern university because of a funded project. At several institutions, funding from both corporations and the NSF led to the integration of robots into introductory courses. In a few cases, faculty mentioned administrative support for special initiatives at their institutions for the purposes of creating awareness and action. For example, a teaching center at one Midwestern university held a small conference with talks about improving teaching, exposing one professor to new ways of using teamwork in his class. A lecturer at a state teaching institution described hearing about innovative teaching methods while participating in

a project funded by her university's teaching center. A new assistant professor in a small college described monthly participation in a sponsored reading group that met over lunch for a "free-for-all discussion" about best teaching practices. However, while all but one of our 66 interviewees said their institutions had centralized teaching support, very few had ever used them.

Expected and Unexpected Awareness from Conferences. Faculty talked about learning about teaching practices at conferences such as SIGCSE, ASEE, FIE, and the NCWIT Summit. In many cases, information that faculty encountered at conferences suggested a solution to a problem they were experiencing. For example, one professor said she found out "about pair programming when I was at the ACM conference… I had given a test and I was just destroyed over the grades I had got, so I said, 'Ok I'm going to try this idea that I heard about.'" Another inverted his course based on a presentation at ASEE, saying, "I was reacting to what had happened to me in my first semester here, when I felt I was not able to keep the attention of the students." One professor said, "I really think about things like SIGCSE as making the difference in how we do big changes." While these comments are unsurprising for educational conferences, faculty spoke less often about discussing teaching at technical conferences. A full professor in the Rocky Mountain region described teaching conversations as "not completely unusual," implying they are at least somewhat uncommon.

Learning from Colleagues. Many faculty reported discussing teaching issues and borrowing ideas and syllabi with colleagues. A professor at a small private college said, "I learned most of what I know about this from my colleagues. I learned a lot about curriculum from <colleague>, who's sort of the national expert on this." In some cases, departments are laid out physically in ways that allow "water cooler talk" about teaching: unplanned, casual conversations. For example, a focus group interviewee said "We chat in the hallway [laughs]" and his colleague explained, "The printer is at one end and the restrooms are at the other." It might be possible to attribute these interchanges to local culture: most of our interviewees in teaching colleges expressed a strong commitment to teaching and collegiality around teaching. In contrast, a professor at a large, public research university said she rarely spoke to her colleagues about teaching: "It's an enormous building…for me to go from my office, which is way up in the tower, to the most distant office is probably something like a 15 minute walk." Research faculty seemed more likely to mention seeking syllabi and ideas from colleagues they knew from research conferences than from their local colleagues.

Some Faculty Don't Find Out. Awareness of the possibilities for changing teaching practices is required in order to make a change. Some professors simply are not on the lookout for and never hear about teaching innovations. For instance, a lecturer at a small technical school in the southeast seemed to assume that the interviewer was asking about research journals and conferences (not educational conferences) when he was asked about whether he used those as sources for teaching innovations, saying "I haven't been to many conferences. I'm a lecturer so I have a teaching load…There's no time for research…" When asked if he had heard of SIGCSE or read any articles about teaching in journals, he said, "Not much. No." Similarly, when a doctoral instructor was asked if there were teaching approaches he would like to use if he had time, he was unable to provide any examples.

4.2 Why do Faculty Try Out Practices?

Institutional Influences on Exploration. Some faculty had both the freedom and encouragement to explore teaching innovations and take risks. Asked, "How big of a factor is teaching on tenure and promotion around here?" a department chair at a state teaching university responded, "Very important. You have to be an above-average teacher to get tenure. You can be slacking in publications, but you have to be above average in teaching." But this did not imply that exploration was not encouraged. When asked, "When people decide they're gonna try something new around here, how critical are those student evaluations?" the same chair replied, "People like to see people trying new things. I've been on personnel committees and we tend to look favorably on people who tried and failed rather than not try anything at all."

At research institutions, however, faculty described a tension between teaching and research. Even where there is public rhetoric to the contrary, faculty disbelieve it because of the pressure to produce research and because of tacit beliefs that you can't be a good researcher if you're a good teacher (e.g., "the provost said our top priority is undergraduate education and … [laugh] on whose planet?"). Describing her tenure case, a professor at a large, state university described her involvement in a textbook project and the development of lab materials. She was ranked as excellent for both teaching and research, but that was perceived as a problem: "When I came up for tenure I got kind of smacked around at the college level because I had this big education credential. And they were just like, 'she shouldn't have this education work if she's serious about being a researcher'."

Cost-Benefit Analysis. Faculty implicitly or explicitly weigh the costs and benefits of adopting new practices relative to existing practices. Without any real evidence in favor of a practice, faculty may decide not to take the risk of experimenting because of the possibility that it will be counterproductive or make problems worse. For example, a few interviewees felt that their students would not be receptive to change. Discussing the potential of in-class group work, a department chair said, "Wonder if students would react well to that though…I'm thinking that some of the very shy students wouldn't really participate. There's always one or two who you never really hear from during class. I wonder how to get everyone involved."

Weighing time for preparation against time saved from other teaching work was also common. In describing what a colleague had told her that convinced her to experiment, a full professor at a research university said, "And he decided to teach it in a conversational style where he came into the classroom and they just had conversations about the material they were supposed to have read. And he somehow minimized the homework so he wouldn't have as much grading." Yet the time needed for modifying a course is a nontrivial consideration. An assistant professor in an engineering college said, "So the first semester I spent a lot of time, maybe the equivalent of six or eight hours a week extra over my normal preparation, to build all of the online slides and quizzes to make this all work. And now it's more of just the management process where I make a few updates and changes but it's pretty smooth." But this professor's addition of preparation time is not possible for everyone. Another professor's dream was echoed by many: "I'd love to be able to take a semester off and just rethink all the examples in my course."

Power of Role Models. The professors that faculty themselves had learned from can be powerful influences on teaching approaches and attitudes toward students. For example, a professor at a private liberal arts college in the northeast spoke with reverence about his role model, a "very famous computer scientist" who "had a class of typically 40-45 students, and by the second week had all of our names down." The interviewee went

on to say that his professor had genuinely cared about students. The class this interviewee taught that day, the first week of the semester, had 36 students, yet he took the time to call out students' first names and look them in the eye. It was clear that he was carrying forward the commitment to students that he perceived from his former professor. Another professor chose not to use slides because he felt he had learned more effectively from a favorite professor who did not use them. The deep socialization from experiencing school in a certain way can be tacitly normative. Another said, "I bought the idea because that was how I used to study when I was a student." In describing the decision to change to a peer instruction approach, a lecturer from a large public research university said, "Frankly it just seemed kind of crazy until I tried it myself. You know, like one of these fad diets. I think it's unfortunate that for almost all of us, our experience of education has been just the straight lecture and so everything else does feel really out there."

Trusting Sources and Shared Values. Participants often mentioned colleagues (local or distant) as having influenced the use of specific teaching practices by describing ways in which they were similar. Faculty trust colleagues who have similar teaching and research contexts, share attitudes toward students and teaching, or teach similar subjects. In describing what conference speakers he finds credible at SIGCSE, a professor at a private liberal arts university acknowledged, "I do have the anti-'Research One' bias. Like if the speaker is somebody who teaches at <prestigious public research university>, the mental clout that I give them as a teacher—unless they're a lecturer—I drop them a notch. When someone stands up to speak and they're from a really successful teaching college <names several> or universities that have a real reputation of being great undergraduate teaching institutions, I give them a lot of merit." He said that he has to try to consciously correct for that bias. Similarly, but more subtly, a professor at a private religious school accounted for trusting someone from an R1 university because "When she was a grad student, she taught classes and took education classes, and she really had a big focus on self-improvement and being an excellent teacher, saying, "And she is." Similarly, a professor at a research university referred to a colleague at another university as a "research superstar" with whom she had discussed a teaching strategy at a research conference, because he teaches the same subject area. The assumption that he could be a good teacher was not automatic–"He turns out to be a spectacular teacher and he's won teaching awards at <his university>"–and yet she sought advice from him rather than approaching colleagues in her own department who had published a series of articles on the approach.

Senior faculty or faculty with high student evaluations can also be credible influencers. In response to a question about where he had learned of a new technique, an interviewee from an engineering school said, "Yeah, there is a senior faculty and after my first semester, he asked me how am I doing and he told me I could bring the [student] evaluations and he could try to give me advice on how to improve them…He's very tough but still he gets chosen as the best professor by students."

Competing with "Covering." There is also a tension between adopting new practices and "covering" content. If a professor adopts a new teaching method, it may take more time, so some content may not get "covered." In that case, a professor may annoy a colleague or slow down students' progress in a subsequent course, as described by the following professor. Asked, "So, there is an expectation that you will cover certain things, but it's not a mandate?" she replied, "Oh, it's a mandate. I mean, if I send students up and they feel none of the students from my course knew how to iterate, that's gonna be a big problem…There is a document that says 'This is what this course teaches.'" This was the case both in teaching-focused and research-focused institutions, but it was not universal. Although there can be heavy constraints on what material is covered, professors have the freedom to change the emphasis or order within the syllabus. For example, an assistant professor said, "So when I introduce concepts at the beginning, those concepts get practiced more because they use them more through time, than [topics covered] at the end." Covering a certain set of material did not necessarily translate to ensuring that students know it, but is often critical for retaining accreditation.

Classroom Layouts. We heard from multiple faculty about how the physical space and affordances of the classrooms either supported or hindered implementation of particular practices. For example, when desks or chairs are bolted to classroom floors, it is physically difficult for students to face each other and work in groups. A professor at a large public research university said, "This class is really kind of traditional in its structure partly because of the classroom." In other words, she chose a lecture-style approach because she taught in a stadium-style lecture hall, where long tables and chairs were bolted to risers.

Equipment, too, can enable or impede practices. For example, a lecturer at a public teaching university said, "It would be very easy for me to implement [a collaborative learning approach], because lecture and lab are in the same room. So it would be very easy to stop for 15 or 20 minutes and you know, work on a small problem." In several classrooms, large, flat-screen monitors in front of students made even 'making eye contact' with students difficult, though some faculty managed the issue. For example, although an imperfect solution, one professor had students turn their chairs perpendicular to the tables and face the side of the room for lecture, because he couldn't see students behind the monitors. Although faculty often cannot control the physical space, they can change what the students do in it.

Research Evidence? Despite being researchers themselves, the CS faculty we spoke to for the most part did not believe that results from educational studies were credible reasons to try out teaching practices. One professor heard a keynote talk at SIGCSE about flipping the classroom and decided to try it. He said he thought there were also a couple of "presentations with data," but did not attend them. When asked whether educational studies are convincing, he said, "No, there's a big push to do those kinds of studies, but I don't buy the significance of the studies. It sounds good, it sounds like it's worth trying, but the data that's presented is often not very convincing."

4.3 Why do Faculty Keep Using Practices?

Student Feedback is Critical. Perhaps the single strongest kind of evidence that supports a decision to routinize practices was student feedback. Faculty are concerned with student learning, student engagement (often as the opposite of "bored"), students "liking" their classes, and students being able to gauge their own learning. Faculty use comments in office hours, class, and student evaluations, assessments of performance, attendance in class, and inferences drawn from nonverbal behavior to make judgments about effectiveness. At an engineering school where graphics had been heavily integrated into early courses, the professor said that students were so pleased with their work that they "showed it to their mom and dad." In a similar example, students displaying their robot programming prowess in dormitory halls created huge demand for the introductory course. Student attendance was also

perceived as a sign of excitement; for example, a professor at a Midwestern state teaching university trying out a more interactive teaching style said, "This semester, I was amazed that the first month in discrete mathematics almost had perfect attendance." Student excitement about what they are doing in class, even if unrelated to evidence of learning, was considered very important.

On the other hand, if students don't "like it," faculty are unlikely to continue using a new practice. At a public research university, a professor said, "You can do something that you think, 'Wow! If the learning experience was way better this term, the experiment really worked.' And then you read your teaching reviews, and it's like the students are pissed off because you did not do what they expected." Even when students "like" it, however, faculty may not commit to a practice if they believe students are not learning as much—even when the evidence is based on inference rather than performance. A lecturer at a four-year public school felt that lecturing in class gave him more feedback on whether students were understanding the material, as well as more opportunities to use alternative examples and explanations, than a flipped classroom approach, saying, "The students do really like it. But I'm worried that they're not learning as much so far. I worry about the discipline and concentration that they put into watching the videos as opposed to in a classroom and I'm lecturing. I can gauge whether or not they're getting something, whether they are paying attention, and then hammer the points that maybe they are not catching as clearly."

If faculty have self-assessed evidence, such as "I started to do this and grades improved," they are more likely to retain the practice. Similarly, if faculty believe that students are more engaged, they may routinize practices even if it competes with covering concepts. Describing the integration of an interactive teaching approach, a professor at a teaching college said, "There is material that I would cover that I don't now because of things getting slowed down for the interactive stuff. But I felt like when I have lectured and just blasted through things on overheads, my course evaluations have a definite percentage of students that said, 'He's pretty boring.'"

Requirements from Funders and Faculty Buy-In. In some cases, practices became routinized because of the desires of granting agencies for pilot project outcomes to be sustained or institutionalized. For example, at an engineering school in the southeast, grant-funded revised curriculum was integrated into several courses. And as described above, in departments where curriculum is fixed (and enforced) by departments or committees, it cannot be changed later without a lot of wrangling. One of the professors (not a principal investigator of the grant), said "No one can prove that this technique is better than another. But our choice was to experiment. Overall it's been positive." When there is buy-in from other faculty in the department or even outside the department, curriculum is more likely to be routinized. In another grant-funded initiative, a professor at a private liberal arts college worked with faculty in other disciplines to create theme-based courses. She also helped faculty in "15 different disciplines [to] infuse a computational component into their courses."

5. DISCUSSION AND CONCLUSION

Adoption of teaching practices follows the stages of awareness, experimentation, and routinization. Adoption is not a "rational action," however, but an iterative series of decisions made in a social context, relying on normative traditions, social cueing, and emotional or intuitive processes. Consistent with other studies on CS faculty, [11,27,28] faculty are not likely to use educational research findings as the basis for adoption decisions. Faculty become aware of innovative practices either because a problem leads them to intentionally seek them out, or they hear about them through funded initiatives, conferences and journals, or from colleagues. They experiment (or not) for several reasons, depending on institutional expectations and policies, perceived costs and benefits for themselves and students, and the influence of role models. Faculty tend to trust other faculty whose work and institutional context is more like their own. The choice to try out practices competes with the need to "cover" material, as well as with classroom layouts. Positive student feedback is taken as strong evidence by faculty that they should continue a practice. Funded initiatives that are designed to get buy-in within the department are more likely to become routine.

Designers and developers of educational innovations might use the information presented here to improve adoption. Getting the word out about innovations is a critical part of dissemination. Presenting and demo-ing at educational and technical conferences can help to reach potential adopters. However, finding a way to get those who attend conferences to communicate to colleagues on behalf of developers can reach much further. For example, providing information cards or other materials to take home can be an effective way to start conversations, provided that the messaging is relevant to faculty concerns.

Developers might increase the chance that faculty try out innovative practices by using messages that address faculty concerns. For example, highlighting a problem to be solved, the time needed for implementation, the outcomes to be expected, how to evaluate outcomes, and perhaps pointing to textual or multimedia information online could be useful. In their communications, developers can demonstrate understanding of institutional constraints, classroom spaces, and how teaching practices or curricular material fit in with the need to cover existing material. By acknowledging the tension between "covering" content and ensuring that students have a robust understanding of a topic, developers may have more success in convincing potential adopters. Faculty may decide that a new approach is too risky if the preparation time outweighs the time saved in other teaching work (such as grading), especially if the expected gains are minimal. By explicitly addressing how long it takes to implement a teaching practice, and outlining the benefits and costs to themselves and to students, developers can help faculty make informed decisions both when they try out innovative practices and for continued use. Although CS faculty do not use educational research evidence as their first selection criterion, research evidence doesn't hurt, as long as the context in which the research was conducted seems analogous to their own.

Faculty are more likely to innovate—even if they think the idea "sounds crazy"—when they are promoted by people whom they believe understand their teaching and research context. Role models, whether their reputation is that of a great teacher, research collaborator, or preeminent researcher in the field, offer developers a useful hook. While faculty get ideas to try something innovative from conference presentations or journal articles, they might filter the information through biases about the author's (or presenter's) research and teaching background, the (dis)similarities of the course material, and the characteristics of the institutions from which they come. Developers might circumvent biases by marshaling trusted sources and demonstrating shared values when approaching potential adopters. Funding is a substantial lever for potential innovation adopters. Developers with funds can influence adoption by providing grants, provided they encourage faculty to gain buy-in and integrate curriculum and practices beyond the single course.

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