A Case Study of Technology-Assisted Advising Tools in Five High Schools

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Nationally, high school education is moving toward an approach where college and career preparation are equally emphasized. The goal is for students to graduate high school with the training and skills needed to enter the workforce, whether or not they go on to pursue additional education. High school career exploration and preparation can involve field trips to work sites, mentoring with professionals, and even internships and apprenticeships. Career and technical education (CTE) classes — which enable students to learn skills and obtain certifications in high-demand industries such as information technology, healthcare, engineering, or manufacturing — are another important part of this preparation.[1]

Recently, many states have adopted legislation that facilitates easier access to CTE pathways and career exposure in high school. Policymakers are taking steps toward making career and technical education more accessible during the school day, for example by making graduation requirements more flexible, allowing students to fit career exploration into their schedules without jeopardizing their ability to graduate on time. Policymakers are also creating accountability metrics to track students' progress toward workforce preparation and making funds and guidance available to school districts, so they are equipped to offer career-readiness activities.[2]

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While these are important steps toward making students better prepared for the workforce, they also require significant investments in human power at the school level. Counselors and other school staff members are essential to students' career-preparation process, as they are the people whom students see regularly and can turn to formulate academic plans that are aligned with their career goals.[3] Yet counselors and other school staff members often have high caseloads that can limit the time they are able to devote to individual students.[4]

Technology-based advising tools offer a potential solution to these problems: They may be able to enhance school-level advising without schools needing to hire more counselors. As a result, such tools are growing in popularity. Today, at least 20 tools are deployed nationwide that offer assessments designed to help students measure their own aptitudes and explore career and educational pathways aligned with those aptitudes. It is estimated that some 47 percent of high schools and 40 percent of middle schools have purchased these off-the-shelf tech advising tools, while an additional 50 percent of middle schools and 50 percent of high schools are building custom tech tools.[5]

Despite their increasing importance and use nationwide, there is little evidence about the efficacy of these tools. Do career advising tools truly enhance the number and quality of options students are presented with when considering career-aligned courses, college options, and careers? And do students put the same stock into personalized recommendations from tech advising tools as they do those from counselors or teachers?

To explore these questions, MDRC conducted an implementation study of two tech advising tools, Xello and YouScience, in ninth- and tenth-grade classrooms during school years 2021-2022 and 2022-2023. This brief follows five implementing schools where students completed assessments and received their results in the form of guidance on CTE courses and career recommendations. The study team conducted interviews and focus groups with teachers, counselors, and students in the five schools over two years. From these conversations, interviewers hoped to glean what students and school staff members thought of the tools, how students and staff members reacted to tool-generated career recommendations, and whether students considered these results when selecting courses for the following academic year. Four primary findings surfaced from these conversations, as described in Box 1.

Study Design and Sample Characteristics

Xello and YouScience were selected because they allow students to identify their career aptitudes using built-in assessments and to explore various industry pathways. Based on the tool assessments, ninth- and tenth-graders received tailored insights into careers they might pursue, associated salaries, and the level of education they would need for these careers.[6] While 23 schools were invited to use the intervention as part of a randomized controlled trial, only 11 of these schools actually implemented the tools; 6 were assigned to Xello and 5 to You Science.[7] Of the 11 implementing schools, 5 consented to interviews and focus groups; 3 of these were implementing Xello and 2 were implementing YouScience. Interviews were conducted with school staff members that covered their perceptions of the tools, how students used and reacted to the tools, and the extent

Box 1. Findings

1. **Extent and Quality of Implementation:** Among the five schools using the advising tools, all used the tool with at least some of their students (with significant variation in usage). In schools where school staff members and leaders were committed to implementation and the technology worked well, students tended to have better experiences.
2. **Reactions to Tool Results:** School staff members and students both had preconceived notions about what students were capable of, but reacted differently to tool results that did not fit those notions. Teachers and counselors encouraged students to explore unexpected results from the tool, whereas students tended to be less flexible about the careers they wanted to pursue.
3. **Tool Influence on Student Mindset:** Students were exposed to careers they were previously unfamiliar with, and learned about the salaries they could earn and the education required to succeed in those careers.
4. **Tool Influence on Course-Taking Decisions:** Students could not always act on their tool results when picking career-related courses. Often, students' decisions were limited by course offerings at their schools and were also influenced by what was socially acceptable in their community or family context.

to which students' course-taking decisions for the next academic year were influenced by the tools. Student focus groups covered the same questions but were conducted in group settings to make students more comfortable when answering interviewers' questions. In total, the research team conducted staff interviews at five schools and student focus groups at three, as shown in Table 1.

The five implementing schools are the sample from which the observations in this case study are drawn. These schools represent different geographies — rural, urban, and suburban. These schools, like others in the larger impact study from which this sample is drawn, offer CTE pathways in fields such as business, advanced manufacturing, digital and technology infrastructure, healthcare, and more. In these schools, students often had the opportunity to choose elective classes, or even entire course pathways, as early as tenth grade (presuming that students were not behind on the academic credits needed for graduation).

The five case study schools were given free access to one of the two tech advising tools in addition to training from the tool provider. In turn, specific school staff members (either teachers or counselors) oversaw tool implementation with all enrolled ninth- and tenth-grade students during a designated class period. A designated counselor or teacher agreed to attend up to two hours of introductory training covering the basics of how the tool works and how to set up student accounts. The tool providers also shared implementation guidance materials with all staff members overseeing implementation. Teachers and counselors overseeing implementation were able to reach out directly to their tool providers should they need additional training or technical assistance beyond their initial introduction. Participating ninth- and tenth-grade students — following parental approval — were expected to create accounts and complete a series of aptitude tests culminating in recommendations about courses and careers to pursue based on the results.

Table 1. Case Study Schools (2021-2023)

School	Focus Groups	Interviews	Geography	High School Enrollment	Grade 9 Enrollment	CTE Electives and Pathways Offered
School 1	0	1	Suburb	1,642	484	Culinary arts, engineering, art/ graphic design, music, theater, business,
School 2	0	1	City	450	117	Information technology, computer science, electrical technology, architecture, culinary arts, digital media
School 3	1	2	Suburb	222	119	Woodshop/carpentry, fine arts, business
School 4	1	2	Town	396	115	Automotive repair, woodshop/ construction, welding, business, culinary arts/ hospitality, computer science
School 5	1	2	Rural area	110	20	Computer science, woodshop, agriculture, mechanics, culinary arts, fine arts

SOURCE: National Center for Education Statistics Common Core of Data 2020-2021.

During the periods students were using the tool, school staff members overseeing implementation agreed to walk around to ensure that students completed assessments. They were able to monitor students' completion through their instructor dashboards to encourage full use of the product features. Teachers and counselors also agreed to assist students with any questions they had with the tool and talk with them about the results after they finished using it. Tool providers tried to make these conversations easier with built-in discussion guides that were part of the tool interface. School staff members would then use tool results to help students identify their skills and aligned courses they could take at their schools, and to begin developing career plans. The study team estimated that, from start to finish, it would take students three to five class periods of 45 to 60 minutes each to complete these activities. Most students in each school did not complete every assigned assessment, but did complete enough that the tool was able to generate at least an initial list of students' aptitudes and recommended careers.

The research team sought to answer the following questions with the interviews and focus groups conducted across the five schools:

1. To what extent was the tool implemented as intended in the five study schools?
2. How did students and school staff members react to students' results?
3. How did the tools influence students' thinking about course pathways and potential careers?
4. To what extent were students able to act on their results in making decisions about course pathways and careers while in high school?

Findings

The sections that follow address these four research questions.

To What Extent Was the Tool Implemented as Intended?

Tool Implementation Varied Widely

Students were given an average of 5.4 class periods (or 249 minutes) across the five study schools to complete the assessments (from initial log-in to completion and interpretation of results). There was at least one staff person overseeing tool implementation at each school, and that person tended to be either a subject-matter teacher (for example, English, Spanish, or CTE) or a school counselor. All school staff members attended the required tool's training before working with students to implement the assessment.[8] Average tool implementation varied across all schools. Table 2 shows school-level implementation in more detail.

Table 2: Variations in the Implementation of Tools

School	Implementation Level
School 1	Low
School 2	Low
School 3	Some
School 4	Some
School 5	Some

NOTES: The Xello tool had 4 required modules, while the YouScience tool had 11. Among schools where students were assigned 4 modules, "low" means that the weighted average of number of modules completed by students by the end of ninth grade was greater than 0 but less than 2. When the weighted average of number of modules completed by students was between 2 and 4, schools were categorized as having completed "some" implementation. Among schools where students were assigned 11 modules, students tended to either complete all or no modules. For this reason, "low" means that less than 50 percent of students in a school completed all modules by the end of ninth grade, and "some" means that 50 percent or more of students completed all required modules.

School Staff Members Could Help Students Engage with Tools Meaningfully

Because school staff members were responsible for overseeing the tools' implementation, how they introduced and discussed the tools with students mattered. Teachers and counselors had the ability to help students understand the kinds of tests they were taking and how to interpret these assessments.

One student described benefiting from having a teacher interpret the personality-assessment results: "She … explained interpersonal style is how you interact with other people. And of this [aptitude] circle, the biggest slice is the slice you're the best at." The teacher made it clear that aptitude testing reflects what students are best at, and that pie chart slices represent how proficient students are in a skill relative to their other strengths. The teacher met students at their developmental level and used language they could understand so that the tool results were meaningful to them.

Teachers and counselors were also instrumental in helping students realize that the tool-generated aptitude results were linked to career recommendations, which might not otherwise have been apparent. One student explained: "[The school staff member] showed us how … the little compatibility circles [in the aptitude assessment] lined up with careers and stuff." Beyond simply helping students understand the logic of the tool, teachers and counselors also pushed students to reflect on their results in meaningful ways. One staff member describes asking students to research their top five best-fit careers:

> I asked them [to] … tell me what the career is, what's the required education, [and] how many projected job openings there are for the career in the U.S. by the time they would be graduating. And then I had them tell me the … salary range for the career. I had them summarize a day in the life.

School staff members made the connection between tool-generated career results and students' futures explicit by having them map potential futures in their best-fit careers, including how much education they would need, how much they could expect to earn, whether they would need to move out of state, etc. That is, they made a point of connecting tool results to potential student career and educational trajectories.

School Staff Members Influenced the Meaning Students Derived from the Tools

Teachers and counselors can make tools more meaningful to students by explaining what results mean and encouraging student reflection. In the absence of that support, students may resonate less with the tools or "forget about it" entirely — as demonstrated by the following exchange:

> Interviewer: And so after you had that two weeks … where you were able to use the tool … did you do anything else with it?
>
> Student 1: No … we haven't touched that site since.
>
> Interviewer: No one else has brought it up again?
>
> Student 2: It's kind of been dropped…. I completely forgot about it.

Both students and staff members said that students needed school staff members to provide some kind of indication of why tool usage was meaningful and relevant to their future college and career planning. Sometimes teachers were not able to explain the tool or its career results to students. For example, one student said, "I kind of was left in the dark … because he's a Spanish teacher. I can't really ask much about anything that I want to do." The student explained that perhaps those questions would have been answered if the tool were implemented by a guidance counselor, because guidance counselors frequently help students discuss their college and career plans. Staff members' ability to interpret the tools for students, then, was influenced by their own knowledge of careers.

There were also school staff members who chose not to implement the advising tool rigorously because they believed that their students were not ready to explore careers. One teacher described picking and choosing which assessments to perform with students. When probed as to why not all study-required assessments were administered, the teacher explained that ninth-graders are too young to engage with information about careers meaningfully:

> [They] just left eighth grade.… Their focus is that transition to high school, making … friends, … sports and activities.… When you start getting into junior [year] … [they're] upperclassmen.… They're the ones that are [saying], "What's my future?"

School staff members' inability to see the point in using career advising tools with students, then, can be linked to incomplete tool implementation. Their reluctance stands in contrast with a federal policy environment in which CTE and career planning are being encouraged for students as early as middle school through legislation such as Perkins V.[9]

Tool Usage Was Also Dependent on School- and District-Level Factors

Beyond the role that school staff members played in ensuring that students used the tool, understood it, and engaged meaningfully with it, school and district-level factors were also critical. In schools where technology was unreliable, in-class time could not always be spent on the product's assessments. Lack of support from school and district leaders also sometimes stymied tool implementation.

Logistically, technology was the biggest barrier to tool implementation. Staff members at some schools noted that they initially struggled to sign into the advising tools and get students access to their own accounts, whether due to difficulties of recalling passwords or general unfamiliarity with the interface. What's more, certain school districts had stronger access to Wi-Fi and reliable computers for students to access the tools. Not all classrooms from the five schools had the tech infrastructure students needed to use the tools during the school day, as demonstrated below:

> Interviewer: Okay … the Chromebooks [laptops] weren't working?
>
> Student 3: I think it was our internet.… [Our] school's internet is sometimes bad.
>
> Student 4: It's our internet, and the computers … are kinda whack sometimes.
>
> Student 3: Basically they just pick when they want to work.

Another challenge to implementation was lack of administrative support for tool usage at the school or district level. District and school leaders played a key role making time for tool use in school schedules. Staff members in schools where separate intervention times were not set aside reported challenges finding time to fit tool use into their schedule because of the need to focus on more urgent priorities such as standardized test prep or finishing a state-mandated curriculum. As one teacher explained: "I mean, time is tough in schools. [If] you … just … get those five days [to implement], that was a stretch because it's testing season." Furthermore, school and district leaders controlled school staff members' access to tool training. In some schools, leaders made training accessible by carving out time for teachers to attend virtual training, as the following teacher describes:

> They [school leaders] pulled us [and] they provided [class] coverage for us … to be able to receive that training. It was a variety of teachers. So computer science … family and consumer science … [and] a business … teacher … [and] the counselor was also part of training as well.

Conversely, in other schools, it was hard for teachers to find time to attend training because they did not receive class coverage to attend. In these cases, they either had to use their out-of-school time or take time out of lesson prep.

How Did Students and Their Teachers and Counselors React to Tool Results?

It appears that students responded more positively to the tool when they felt that the tool results aligned with how they saw themselves or envisioned their futures. When students did not feel that tool results aligned with their competencies or desired paths, they tended to disregard tool results. There were no observed cases where students' results lead them to fundamentally alter their beliefs in their own competencies or career paths.

There was variation in students' responses to their results, which fell across a spectrum of agreement and disagreement. Often students struggled to recall the specific careers that were recommended to them, but they tended to remember the skills the tool ranked them in highly. One student said:

> I thought it was really cool just to have like a label for how my brain thinks. The only thing that I didn't like quite agree with was my interpersonal style [result], because [the tool] said I was … an … energizer and I find myself a little bit more introverted.

Another student expressed surprise as well, but also a willingness to consider the tool's personality assessment:

> I think I was a little bit surprised with how high like my [tool-rated] artistic … inclination was, but I think that was cool because I do really enjoy art.… I think that [art] would be a cool thing to incorporate into my future career.

Students appreciated that the tool provided them with self-knowledge, and liked when it made recommendations that aligned with how they saw themselves:

> [Before], I was still really unsure about where I wanted to like go with my life, and I think just seeing what I would be good at, something like engineering or computer science or aerospace science, it was … pointing me in the right direction.

However, there were students who felt conflicted about tool results because they already had a strong sense of what they wanted to pursue, and they did not see these exact careers among their recommended results:

> I'm very interested in the military aspect of health, like, battlefield stuff … so I'm going into nursing, possibly being a surgeon, but through the military. And it was really hard trying to find that [in my results] because … my homepage is full of stuff … like … cardiac surgeon [or] orthodontist…, but there's nothing military so it's really hard to pair them.

Another student was similarly disappointed upon receiving career results and seeing favored careers ranked lower:

> After all the testing was done and I got my results, one of my "best matches," which I personally don't like, was a bomb expert. And I'm not interested in that, so I looked down to [the bottom of my results], and I see zoology, veterinarian, vet tech, all the stuff I wanted to do. And I'm just like, why?

Finally, some students were indifferent toward their results. One student said, "I don't see the point of this," feeling that selecting courses was not appropriate for ninth-or tenth-graders because they were still early in high school. Another student said: "I know what I want to do … [and] I've been set on it since I was little." For this student, it was important to pursue that chosen field whether or not the tool results pointed in that direction.

School Staff Members' Reactions to Students' Results Varied

As noted earlier, school staff members played a crucial role in the implementation of the intervention, ensuring that students completed assessments and reflection activities. They tended to voice reactions to students' results based on their own understanding of students' abilities and strengths.

Teachers and counselors generally appreciated that tool results expanded their students' career and academic horizons. Overall, they tended to view the tool results as a means of broadening students' perspectives, and told students to be open to their results. One counselor said to a student who was dismayed to see "podiatrist" as a recommended career:

> "Even though you may not want to do that in your future, that's just … an option that this program has provided you." And I repeated often like, this isn't something you have to [do]. This is just … to show you all your options that you might have.

While teachers and counselors generally supported student exploration, they sometimes had frank conversations with students about what might be realistic for them. One staff member said:

> In ninth grade, I try to keep it [students' options] open to everything.... [But when] ... a student hates math and ... is not good at math ... but yet they want to be an engineer, you know, [I] ... will [say], "Okay, but that will take you working really hard to improve your math skills."

In other situations, staff members were even more explicit about what they thought students were capable of. One teacher voiced a reaction to a student's results that, in the teacher's view, would require an unrealistic amount of academic preparation:

> My one [student] is a total mechanic and doesn't love school. When it [the tool] said [to pursue another career involving] like six years of school, when he clicked on that, I'm like, "Nope. Go back [to your results]."

Some teachers and counselors used phrases such as "high-performing" and "low-performing" to refer to students. They saw academically gifted students as having more career options because of their academic abilities and commitment to "hard work":

> [For] the high-achieving kids ... every door is wide open. They can go into the math side of STEM. They could go into, you know, the medical [field]. They can go into law because they're hard workers.... They're successful in everything and have strengths and are willing to jump in and do anything. So those kids, I knew their [tool results] would just give them anything possible.

The implication, then, is that students who display academic proficiency are more capable of a wider range of careers, particularly those that are seen as socially desirable (such as law or medicine). While this study did not involve classroom observations, it is reasonable to believe that students may intuit when their teachers or counselors do not feel they are capable, and that this perception may influence their course-taking decisions and career aspirations negatively.

How Did Tool Use Influence Students' Thinking About Careers and Potential Courses They May Be Interested in Taking?

Students Learned About a Wider Variety of Careers

While students' understanding of themselves and their futures might not necessarily have changed, their tool use expanded their knowledge of the overall career landscape. Students in rural schools in particular noted that they learned about "a ton of jobs" that they do not see every day and that they might really enjoy, but that they had never known existed before. One student said:

> I didn't realize that there was so much stuff that a technician would be working on, like a connection technician for a hospital. I found ... five [technician jobs] that were different. One was for ... an MRI machine, one was for X-ray, and just other stuff that I can't remember.

Another student expressed a similar sentiment about learning that there were an unexpectedly large number of potentially suitable jobs in information technology:

> [My career results] had something to do with computers and … designing video games and stuff, and I hadn't heard of it, and it was really cool and my skill set matched with it. And I was like, "Oh, that would be fun." So I … saved it. Yeah. Some of the jobs that I didn't even know existed … seemed to fit really well.

Students Learned What Salaries to Expect from Certain Careers

Some students also benefited from learning the salaries they might earn in different careers, which did not always align with their preconceived notions. One student became inclined to consider a career as a city planner after learning how lucrative it could be, and how in-demand this skill was:

> The city design planner one [result], I think I was surprised that you could make that much just for like building layouts. I guess I didn't … it surprised me how often you would need to build cities.

There were also students who were inclined to consider different careers and academic pathways given how much a career paid on average. For example, one student who initially wanted to be a teacher insisted that a medical career might be more appropriate given the salary differential:

> I mean, anyone's mind is money, right? And if you want to be a doctor, or a surgeon, or somebody like a lawyer or a judge, obviously they make money, good money.… It was very throwing off because say if I wanted to be a teacher, okay, that doesn't pay very well but I like that. But a doctor pays $100,000 a year, but maybe I don't like being a doctor but I'm going to do it anyway because it pays more.

Students also began to appreciate that different skills are awarded different salaries based on the level of difficulty or stakes associated with them:

> Certain jobs I've looked at, like a bomb specialist … get $80,000 a year plus hazard pay. You have to get paid for hazard pay because you're risking your life during those situations.

Students Learned About Educational Requirements for Different Jobs

Students also appreciated learning that different career paths required different levels of education. For example, one student who was not particularly excited about pursuing several years of postsecondary training was glad to learn that being a policeman, which paid a decent salary, did not require as much training as, say, working in healthcare:

> [In my results], there was some jobs I saw that had little training, but a lot of pay … and then … a few more jobs that had, like, four-plus years of schooling and the pay was significantly less, which [was] kind of surprising.… I think one of them [was] a police detective. It was like little training, like, maybe a year or two, mostly like on-the-job training. And it paid significantly more than, like, this other … health professional job I think that had a lot of training.

For some young people, college might not be a viable option for financial or personal reasons. For such students, it was gratifying to learn that college was not always necessary to have a well-paying job. As one student said:

> I [grew up thinking] I was … going to go to college for something…. Then I saw [the tool results] and I'm like, "Wait a minute… [there are] more jobs that don't require college. I just don't have to limit myself going to college."

On the other end of the spectrum, there were students who became motivated to pursue additional education from their tool results. For example, students who were interested in medicine and learned that they would have to get a medical degree and clinical experience to practice became more interested in that additional schooling.

To What Extent Were Students Able to Act on Their Results in Making Decisions About Courses and Preparing for Careers While in High School?

Students' Options Could Be Constrained by Course Availability

Students' ability to explore courses linked to the careers they learned about from tech advising tools was limited by graduation requirements and CTE course offerings. Classes suggested by students' results were not always available at students' schools, so students could not always act on those results. As one student mentioned, "I got a lot of like 'architectural' jobs in my results. And I don't think we really have much of … that here, which I think … would be a cool class to offer."

The second barrier that students noted was that, as ninth- and tenth-graders, they had limited flexibility because there were still many core courses that they were obligated to take. One teacher said, "Kids have no choice. They have to take English, math, science, [and] history." In addition, students who fail a course are further limited in their course-taking exploration because they must retake core classes to ensure on-time graduation. According to another staff member:

> Let's say a child wants to go into the fine arts, but they fail a core subject, [administration] will take away their option of being in a fine arts elective and put them into a mandated … recovery class.

School staff members reported feeling frustrated with students' inability to act on tool results given curriculum requirements. According to one teacher: "I know we want to use Xello before [students] pick their classes, but [if] you're a freshman that pulls up … doctor … I can't give you anything [to take] until your junior year." The implication is that older students have more room for electives in their schedules and can take higher-level courses in math and science than ninth- and tenth-graders.

Students' Course Selections Were Also Socially Constrained

Students were also influenced to take courses based on their communities and families. When social influences were strong, students tended to pick classes using social influences instead of results from the tool.

Some schools were in small towns with specialized industries such as oil or agriculture. In these areas, parents often worked in a particular trade and had plans for their children to continue that line of work after school. Notably, schools in these regions tended to offer electives and career pathways influenced by the regional economy. According to a teacher, students tended to gravitate toward these courses because of social influences:

> Our county is very heavy on agriculture because we are … farmland.… In a lot of the schools … they do have agriculture, where the kids get to go out, you know, play with the tractor … work with horticulture, [and] work with farming. So that is very heavy in our county because that is a big moneymaker here.

Beyond witnessing what careers community members pursue, students' thinking about careers and career-related courses was also affected by more explicit influences from parents. Parents often played a large role in students' selection of courses. At times, students wanted to pursue courses in which they showed strong ability or interest, but their parents overrode those decisions. One staff member noted,

> I have some freshmen whose parents are dragging them in here. The parents are coming in and saying, "I'm picking my student's [elective] classes because they need to be focused on their future."

Similarly, a student described parents' influence in the course-selection process for the following academic year: "I sadly have to step back because I don't have power over [my] parents."

Discussion and Conclusion

Ultimately, this study fits into a broader policy discussion about how to prepare high school students for the workforce through targeted advising. Online advising tools seem like a promising (and potentially bias-free) innovation that can allow schools to provide more workforce advising to students without needing to hire more teachers or counselors.

While observational in nature and based on a small subsample of schools, this case study suggests that online advising tools still require meaningful engagement from teachers or counselors to resonate with students. Without teachers or counselors to hold students accountable for completing assessments or to provide explanations of how to interpret results, the tools will not provide meaningful information to students. Furthermore, students require encouragement to think more broadly about their futures and investigate different career and educational paths. Advising tools show

promise as a career-preparation strategy, but they certainly cannot supplant personalized, human advising. This limitation is especially relevant as more and more states are requiring students to create individual learning plans that document specific career skills they hope to gain and classes they hope to take by high school graduation.[10] It is hard to imagine students developing these plans without the continued support of counselors and other trusted school staff members.

Finally, school districts should provide guidance to teachers and counselors for handling situations in which students do not have access to courses of interest. This guidance may involve suggesting related courses when they are available — for example, a student interested in practicing medicine may take a course in nursing in high school. Schools should also develop agreements with other local high schools and with colleges to provide students with access to a wider variety of career-related courses.

Notes and References

1. Klein, Rosen, Beal, and Salimi define CTE as "a method to organize educational systems, courses of study, and hands-on learning experiences that give high school and college students exposure to the academic and technical skills that they will need to engage in the evolving workforce." Sabrina Klein, Rachel Rosen, Katie Beal, and Sarah Salimi, "Career and Technical Education: Current Policy, Prominent Programs, and Evidence" (MDRC, 2023).
2. Ben Erwin, Tom Keily, and Lauren Peisach, "State Policies to Advance Student Centered Pathways" (Education Commission of the States, 2024).
3. National Association for College Admission Counseling and Hobsons, "Individual Learning Plans for College and Career Readiness: State Policies and School-Based Practices" (National Association for College Admission Counseling, 2015).
4. New Skills for Youth Initiative, "The State of Career Technical Education: Career Advising and Development" (New Skills for Youth Initiative, 2018); Sean Cavanagh, "Schools Turn to Digital Tools for Personalizing Career Searches" (*EducationWeek*, 2016).
5. New Skills for Youth Initiative (2018).
6. For more information on the tools, please see links here and here from Xello and YouScience.
7. Forty-one schools were selected as part of the study, of which 18 were assigned to the control group and 23 were assigned to the intervention group (split evenly between tool providers). However, only 11 of the 23 schools assigned to the intervention group ended up implementing a tool.
8. Training sessions tended to be 60 to 90 minutes long. Topics included: how to log in; where to find the assessments, what they were like, and how to administer them; what were the goals of the different advising tool modules and functions and how they could be used; and what to expect from students.
9. Office of Career, Technical, and Adult Education, "Perkins V" (Office of Career, Technical, and Adult Education, n.d.).
10. National Association for College Admission Counseling and Hobsons (2015); New Skills for Youth Initiative (2018).

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