Technology Commercialization Evaluation
Univise Advisor Chatbot
By Will Stockard, Julia Mandel, and Harrison Roloff

Executive Summary

Univise Advisor Chatbot is a tool aimed to provide real-time support for academic advising in U.S. colleges. It occupies unfilled niches in advising systems by offering assistance with general inquiries, degree exploration, and scheduling in an innovative natural language format. Seven interviews and 194 survey responses were collected from a diverse group of current university students, revealing frequent challenges in the undergraduate advising landscape. While this innovation has a proven product-to-market fit and business model, it is hindered by its small market size.

Description of Innovation

The Univise advisor chatbot is a website application that helps students navigate their university's academic system by using generative AI technologies and data optimization frameworks. It has the capability to assist students with general advising inquiries, degree exploration, course scheduling, class discoveries, and real-time waitlist updates.

At its core, the model is powered by OpenAI's GPT-4 large language model. An emerging data framework, retrieval augmented generation (RAG), is then used to make the chatbot an expert in a university's academic environment. It does this by augmenting the base GPT-4 model with publicly-accessible university data. When updates are made to academic matters, the chatbot's backend system ensures the model becomes re-augmented almost instantaneously. Hosting the chatbot on a web application ensures students 24/7 access to an accurate, adept advisor.

Explanation of Hypothetical Customer Need/Problem

Undergraduate students in the U.S. struggle from an inefficient academic advising system. Current university advising systems suffer from ineffective orientations, poor graduation and career preparation programs, unreliable information, widely-dispersed resources, and limited availability. These issues cause students confusion, delays, and leave them to navigate their academic paths independently. These assumptions, if true, illustrate demand for a revolutionary tool in the academic advising space.

Customer Needs Analysis

Data Collection Process

To evaluate these assumptions, two primary research methods were used: seven in-depth interviews (see Appendix B, Table 1 for participant information) and a survey with 194 responses. Both featured diverse representation in age and university affiliations.

The interviewees were given no prior mention of this innovative chatbot tool, ensuring authentic dialogue and open-ended responses. Meanwhile, the survey objectively gauged students' trust in generative AI tools and commercialization potential for the chatbot product. Merging open-ended insights with objective survey data enabled the assessment of the aforementioned hypothetical customer needs.

Orientation Process

Private university students had strictly positive feedback when reflecting on orientation experiences. Layden and Kohloff met in small interest groups and were assigned advisors accordingly. Kohloff also recalls a mandatory semester-long class on degree and career exploration in his first year, kickstarting his college career. At public universities, some interviewees reported robust orientations (Bean, Ochalek), while others reported slight unpreparedness (Waterfield). Overall, though, orientation programs seemed to go well at both public and private universities.

Graduation and Career Preparation

55% of undergraduates report effective advising on necessary courses and sequences for graduation.[2] More specifically, private schools had better overall experiences with academic advising (see Appendix A, Figure 5). Layden highlighted a degree-audit system and helpful meetings at the University of Providence, ensuring clear graduation paths. Kohloff had mandatory semesterly meetings for course selection and staying on track. Conversely, at public schools, Ochalek, Waterfield and Bean illustrated less robust systems with fewer materials and less hands-on advising, indicating a stronger need in public universities.

Advising Recommendations

Almost half of the participants desired a more personalized advising approach to better reflect their interests (see Appendix A, Figure 8). At the University of Wisconsin-Madison, Bean recalls overhearing colleagues receiving inaccurate recommendations from advisors, as well as dealing with the problem herself. On a nationwide scale, about one-in-ten students report inaccurate advice from advisors: things like classes not fulfilling graduation requirements and prerequisite ineligibility.[2] Some interviewees also reported lots of unanswered questions in advising meetings, especially problematic for double-major students (Ochalek, Mark).

1. Flaherty, C. (n.d.). *Survey: What college students want from orientation.* Inside Higher Ed | Higher Education News, Events and Jobs. https://www.insidehighered.com/news/student-success/college-experience/2023/08/31/survey-what-college-students-want-orientation

2. Flaherty, Colleen. "Student Survey Reveals Gaps in Core Academic Advising Functions." *Inside Higher Ed | Higher Education News, Events and Jobs,* www.insidehighered.com/news/2023/03/01/student-survey-reveals-gaps-core-academic-advising-functions.

Resource Discoverability

Students at both private and public universities report problems finding university resources and information, especially during first years. Even though Waterfield, Ochalek, and Layden eventually adjusted, others still reported frustration in locating tools online. While three-in-five students feel orientation helped connect to their campus, only half felt comfortable accessing resources. Furthermore, less than a quarter felt familiarized with mental-health resources.[1] The survey insights corroborate this issue, with only 39.7% of students being satisfied ("good" or "great" ratings) with resource discoverability at their university (see Appendix A, Figure 7).

Availability and Resources

Survey results demonstrate that only 37.1% of students are satisfied ("good" or "great" ratings) with advisor availability. The issue lies more discreetly in the public vs. private advising system differences. For instance, interviewees from private institutions (Layden, Kohloff) shared their required semesterly meetings to plan for course scheduling, smoothing demand around enrollment periods. However, students at public universities generally reported long wait times and limited availability around enrollment (Ochalek, Bean, Waterfield). Ochalek, specifically, mentioned that this issue has led to problems getting required classes and forming backup plans.

Interpretation of Customer Needs

This analysis revealed that students from private universities generally had positive orientation experiences and satisfactory academic advising, in contrast to the mixed feedback from public university students. While advising related to graduation and career preparation was more favorably viewed in private institutions, public universities showed a distinct need for enhanced systems and support. The call for more personalized advising was common among all students, though those at public universities particularly noted instances of inaccurate advice. Challenges in locating resources and information were a shared concern across both private and public institutions, especially for newcomers. However, public universities faced additional hurdles with longer wait times and less available appointments. Overall, these customer insights underscore the importance of focusing more attention on improving the support systems within public universities.

1. Flaherty, C. (n.d.). *Survey: What college students want from orientation*. Inside Higher Ed | Higher Education News, Events and Jobs.
https://www.insidehighered.com/news/student-success/college-experience/2023/08/31/survey-what-college-students-want-orientation
2. Flaherty, Colleen. "Student Survey Reveals Gaps in Core Academic Advising Functions." *Inside Higher Ed | Higher Education News, Events and Jobs*,
www.insidehighered.com/news/2023/03/01/student-survey-reveals-gaps-core-academic-advising-functions.

Market and Industry Assessment

Industry Assessment

Licensing to Schools - Educational Technology and Service

The global education technology market size was valued at almost $125 billion in 2022, and is expected to compound annually at a rate of 13.6%.[3] The most significant trends are new AI innovations which are fueling new developments, primarily driven by the leaders in the landscape: Google, IBM, and Pearson PLC.[4] Despite the potential for developments and funding, there are barriers to entry that make this industry unattractive: data privacy, information liability, and industry adoption rate.

In an interview with Jeffrey Shokler, director for technology and assessment at University of Wisconsin-Madison, he suggested that generative AI technology is about 5 years premature for the education sector. His primary reasoning: enormous liability endorsing a system in which private student data can be submitted and repurposed. Another concern was the intrinsic tendency of generative AI to hallucinate, potentially providing misleading recommendations without human intervention. Despite improvements in reducing hallucinations, convincing the education board of its reliability would be an arduous process, Shokler explained, as the university board decides in a "communal" manner aimed at minimizing risks.

Because the education industry is slow to innovate, and there are often liability, regulatory, and ethical concerns around new technologies like generative AI, the university licensing model is currently infeasible.

Subscription Model - Direct-to-Consumer Educational Services

The subscription model economy has grown 5-8X faster than traditional business models over the past decade. Of this, only 13% of the market includes subscriptions that are to products that come with membership perks. The global direct to consumer subscriptions market is at 58.3 billion with a CAGR of 68%.[5.1] The global education software technology market is 90 billion with a CAGR of 16.3%.[5.2]

3. "Education Technology Market Size & Share Report." Education Technology Market Size & Share Report, 2030, www.grandviewresearch.com/industry-analysis.
4. "Educational Technology Market Size Expected to Reach $257 Billion by 2027 at a CAGR of More than 15% as per the Business Research Company's Educational Technology Global Market Report 2023." GlobeNewswire News Room, TBRC Business Research PVT LTD, 4 Dec. 2023, www.globenewswire.com
5. UNESCO Institute for Lifelong LearningShanghai Open University, et al. "Higher Education." UNESCO.Org, 1 Jan. 1970, www.unesco.org/en/higher-education.
5.1 "State of the US Direct-to-Consumer Subscriptions Industry 2022." State of the US Direct-to-Consumer Subscriptions Industry 2022, blog.pipecandy.com/post/us-dtc-subscriptions-report.
5.2 "Educational Services Market Size, Share, Trends, Competitive Analysis, 2032." The Business Research Company, www.thebusinessresearchcompany.com/report/educational-services-global-market-report.

Total and Target Market

Total Available Market: 235 million undergraduate students worldwide.[5]

Serviceable Available Market: 20.3 million undergraduate students in the United States.[6] Starting with just the United States implies simplified regulation compliance, partnership and integration opportunities, and educational system familiarity.

Serviceable Obtainable Market: Students survey responses from private and public institutions rated their advising system 3.4 and 2.7 out of five, respectively. Public universities have less robust advising systems and more demand for tools. Students are least likely to utilize advisors if the student to advisor ratio is 300+, as the optimal student advising ratio is 300 to 1.[8] Of the 13,000,000 students at the 1,600 degree granting public universities in the United States, 1,400,000 students are in public universities larger than 30,000 (see Appendix B, Table 2).[9] These larger institutions also will have greater network effects and less-optimal student to advisor ratios.[7]

Market Attractiveness

Market attractiveness was determined from the survey responses on students' current generative AI tool usage and students' reaction to a demo advisor chatbot tool (see appendix A, figure 1).

AI Tool Usage

The last of the research survey was directed towards discovering interest in an advisor chatbot tool, the goal being to gauge usage of other generative AI tools similar to an advisor chatbot. 29.9% of students indicated they use ChatGPT at least once or twice per week, and 16% of students indicated they use ChatGPT about every time they open their computer, demonstrating a frequent user base of about half the student population.

More than half of students believe ChatGPT is user-friendly, knowledgeable, and useful. Respondents, however, gave worse ratings on the AI's trustworthiness and accuracy (see appendix A, figure 6). Despite these concerns, 95.9% of students are firm believers in generative AI technology, stating that they think industries will be transformed by AI chatbots in the next 5 years.

5. UNESCO Institute for Lifelong LearningShanghai Open University, et al. "Higher Education." UNESCO.Org, 1 Jan. 1970, www.unesco.org/en/higher-education.
6. Statista Research Department, and Nov 10. "Undergraduate Enrollment in U.S. Universities 2023." Statista, 10 Nov. 2023, www.statista.com/statistics
7. "Advisor Load." NACADA > Home, nacada.ksu.edu/Resources/Clearinghouse/View-Articles/Advisor-Load.aspx.
8. The Developing Role of Student Advising: An Interview with Charlie Nutt, files.eric.ed.gov/fulltext/EJ1106098.pdf.
9. Lindsay, Samantha. "The 51 Biggest Colleges in the United States." *The 51 Biggest Colleges in the United States*, blog.prepscholar.com/the-biggest-colleges-in-the-united-states.

Advisor Chatbot Opinions

When asked if students would use a tool similar to ChatGPT that specializes with advising and enrollment services, students had an overall positive response. Eight questions were asked:
- General academic questions
- Exploring degrees
- Finding interesting/required classes
- Avoiding course schedule overlap
- Updates for waitlisted classes
- Degree, class, or teacher reviews
- Custom AI coursework assistants
- Career and resume assistance

Each response had an overwhelming number of students answer "definitely would use" to the prompted questions (appendix A, figure 2). The survey data indicates that 96.9% of students would use a tool like this for advising-related inquiries, given it's free and accurate. However, to make this product sustainable, commercialization methods must be explored for this market demographic.

Subscription Attractiveness

Students were asked for willingness to pay for the tool, semesterly. Responses indicated that over 70.6% of students would never pay for this tool. However, almost a third of students would consider paying at least $4/semester for this tool, 6.7% willing to pay $8/semester, and 5.2% valuing the product at $15/semester (appendix A, figure 3).

Advertising Attractiveness

To build a significant advertisement revenue, a large user base must be established. External research reveals that website advertising (pop-up ads) produces about $3,000 on average for 500,000 website visits.[10] Although 83% of users would sit through a 15-second or longer advertisement (see Appendix A, Figure 4), the market size isn't large enough to generate significant revenue. In addition to video pop-up advertisements, 84% of students indicated that they would be willing to do a brief research survey for the tool. However, survey advertisements aren't a viable option because of lack of demand. Companies can purchase data from data miners like Google and Facebook to get information for cheaper than survey ads on the web.[11]

Market Attractiveness Summary

While advertisement subsidization will likely not produce significant revenue, research indicates that there's demand for premium services and subscription revenue.

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10. Playwire Technical Team & Reviewed By Anthony Berrena, "How Much Ad Revenue Can a Website Make?" *Playwire*, www.playwire.com
11. *The Data Brokers Quietly Buying and Selling Your Personal Information*, www.fastcompany.com/90310803/here-are-the-data-brokers-quietly-buying-and-selling-your-personal-information.

Business Model and Resource Allocation

Lean Canvas - Univise.org

Key Partners

Student Organizations
- Understanding student needs
- Product promotion

Data Security Experts
- Ensure protection of student data

University Administration
- Advising and career support staff

Third Party Insight Providers
- Integrations, data feeds
- Example: Madgrades.com at UW-Madison

Generative AI Developers
- Llama Index
- OpenAI
- Anthropic
- Google

Key Activities

Outreach Programs
- Establish new partnerships at Unis
- Promotion and marketing efforts

Development
- Build and improve backend models
- New features and web apps

Compliance and Data
- Infrastructure and security
- Regulatory and legal compliance

Key Resources

Technical
- Servers and Cloud Services
- Large language models and data frameworks
- Public university data

Web Application
- Development team and experience

Legal Expertise
- Law and Entrepreneurship Clinic

Value Propositions

24/7 Availability, even during demanding enrollment seasons

Real-time updates and notifications

Personalized recommendations

Resource consolidation and comprehensibility

Enhanced accessibility

Customer Relationship

Interaction and Involvement
- Feedback channels in application
- "Like" or "Dislike" response

Offerings
- Study tips
- Scholarship information
- Career events

Relatability
- Customized chatbot tones
- Old chat strings maintained

Channel

Social media campaigns
- Snapchat
- Instagram
- Facebook
- TikTok

App stores (later)
Campus events and flyers
Search engine optimization

Customer Segments

First Year Students
- University adjustment and early navigation
- Orientation follow ups
- Exploring opportunities
- Resource and tool location

Students Exploring Degree Selection
- Personalized exploration of interests
- Semester planning

Students Exploring Career Opportunities
- Career events
- News
- Resume assistance

Final-Year Students
- Graduation planning

Cost Structure (per 1,000 users)

Users		1000
Semesters		2
OpenAI API Costs*	$	0.005
Average Semesterly Sessions*		3
Average Uses per Session*		4.5
Total Cost/1000 Users	**$**	**135.00**
Server/Infrastructure	**$**	**240.00**

Onboarding Cost (per university)

Promotion Efforts*	$ 5,000.00
Legal Services*	$ 4,000.00
Model Training and Testing*	$ 2,500.00
Application Development*	$ 1,500.00
Extra Cost Buffer	$ 2,000.00
Total Onboarding	**$15,000.00**

Revenue Stream (per 1,000 users)

Users	Semesters	Subscription Amount	Premium (%)	Total Annual Revenue
1000	2	$ 15.00	5.2%	$ 1,560.00
1000	2	$ 8.00	11.9%	$ 1,904.00
1000	2	$ 4.00	29.4%	$ 2,352.00

*Items marked * are unresolved estimates*

Profitability Analysis

User Base Cost (per 1000 users)
*Open AI API Costs
OpenAI bills approximately $0.005 per question asked for GPT-4 turbo model, averaging ~400 tokens (300 words) per question [12]

*Average Semesterly Sessions
Unresolved estimate of average semesterly tool usage

*Average Uses per Session
Unresolved estimate of average questions asked per session with chatbot

Server/Infrastructure
Hosting with Vercel costs $20/month for Pro plan → $240 annually [13]

*Maintenance and Improvement
Unresolved budget of $5000 per university annually to fix bugs and improve model capabilities.

Onboarding Cost (per university)
*Promotion Efforts
Estimated initial marketing costs to achieve network effects

*Legal Services
Unresolved estimate of 10 hours * $250 rate for legal expertise to navigate regulation and data privacy

*Model Training and Testing
Estimated $2000 to program data scrapers and train the model. Additional $500 to test and tune model performance

*Application Development
Reusable website structure, just varying stylistic detail based on university

Revenue

Based on subscription willingness for different price points (see appendix A, figure 3), valuing the subscription at $4 per semester yields the highest annual revenue per 1,000 users with 29.4% of the user base willing to pay at least $4 per semester.

Resource Requirements to Launch

Using the onboarding cost analysis from the Business Model Canvas, onboarding all 38 public universities in the serviceable obtainable market would cost $570,000.

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12. Pricing, openai.com/pricing/. 2023
13. "Pricing." Vercel, vercel.com/pricing.

Projected Annual Returns

Per 1000 Users Annually		Per University Annually	
Revenue	API Costs	Maintenance	Server
$ 2,352.00	$ 135.00	$ 5,000.00	$ 240.00

Serviceable Obtainable Market	1,395,692
Willing to Pay $4/Semester	29.4%
Total Users (thousands)	410.333448
Universities > 30,000	38

Annual Revenue	$ 965,104.27
Open AI API Costs	$ 55,395.02
Server/Infrastructure	$ 9,120.00
Maintenance and Improvement	$ 190,000.00
Profit	$ 710,589.25

Capturing 29.4% (see appendix A, figure 3) of the serviceable obtainable market for $4/semester subscription leaves us with almost $1 million in annual revenue.

Three primary costs will be incurred (as indicated by the red shaded regions), totalling to about ¼ of annual revenue.

This subscription business model leaves the firm with a healthy profit margin, assuming the data collected can be extrapolated to the entire serviceable obtainable market.

12. Pricing, openai.com/pricing/. 2023
13. "Pricing." Vercel, vercel.com/pricing.

Final Opportunity Evaluation

Section	Item	Weight	Score (out of 10)	Weighted Score
Customer Needs	Problem Identification	20%	7	1.4
	Solution Fit	15%	8	1.2
Market Attractiveness	Size and Growth	25%	2	.5
	Perceived Demand	15%	7	1.05
Business Model Feasibility	Profitability	15%	9	1.35
	Scalability	10%	8	.8
Total	Total	100%	10	6.3

Customer Needs

The "Problem Identification" aspect of the Univise Advisor Chatbot scored 7/10, indicating a strong recognition of student challenges in academic advising: poor graduation and career preparation programs, unreliable/impersonable recommendations, limited availability, and widely-dispersed university information. Furthermore, there is also a clear "Product Fit" to address these needs. The familiarity with emerging generative AI tools, the 24/7 accessibility, and promise for reliable results makes this chatbot an appealing solution to fill the advising gaps.

Market Attractiveness

The "Size and Growth" of the market for the Univise Advisor Chatbot is rated at 2/10 due to a small market size of only 1.4 million people, with a tiny semesterly subscription amount. Despite the narrow market scope and long-term growth challenges, "Perceived Demand" received a high ranking (7/10), as more than half of survey respondent admitted they would use this tool to assist them in various tasks, lots even willing to pay for certain features (see Appendix A, Figure 2).

Business Model Feasibility

The "Profitability" aspect received a high ranking, driven by high revenue compared to low costs, even with a large annual budget for maintenance. Furthermore, this product will scale well (9/10) towards capturing the entire serviceable obtainable market as it costs only an estimated $15,000 to expand to a new university, due to reproducible processes. For this reason, the innovation received an 8/10.

Overall Score

The Univise Advisor Chatbot received a 6.3/10 for overall idea attractiveness. While there appears to be a clear need and traction to the product, the serviceable obtainable market size blunders the overall commercialization potential. Still, though, the business model and demand is promising enough to make this innovation a smaller, but still rewarding commercialization.

Appendices

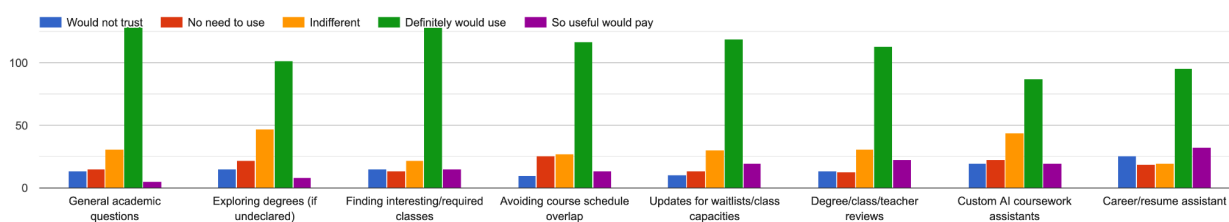| Appendix	Item	Page Number

Appendix A - Charts and Graphs

Figure 1
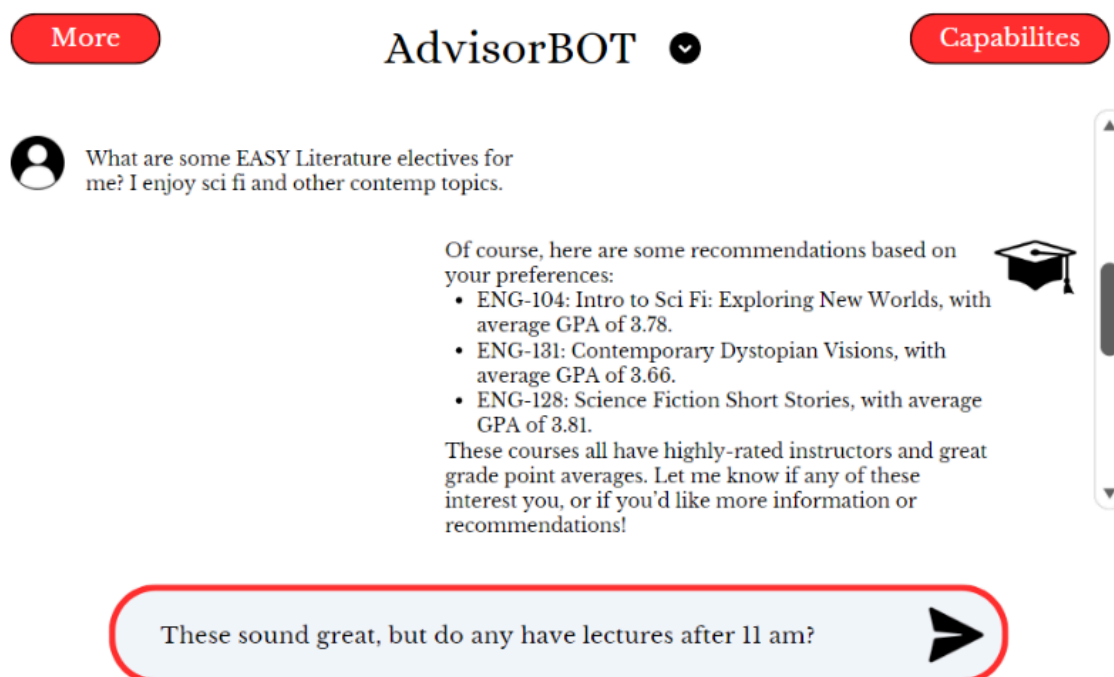
Demo product interface to paint a picture of an advisor chatbot product. Displayed in the second half of the survey.
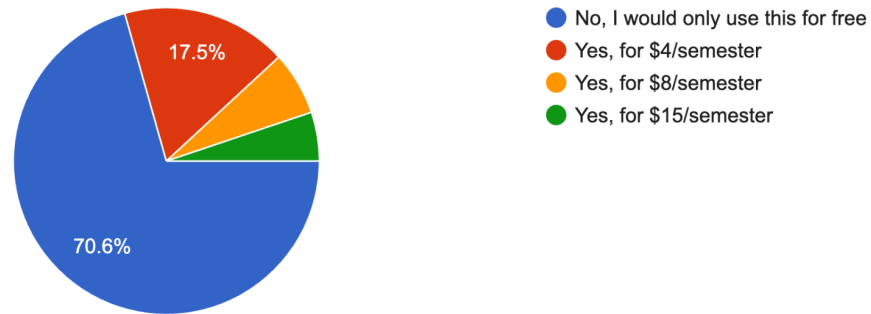
Figure 2

Student interest in advisor chatbot capabilities, following a visual demonstration and explanation of the tool. Capabilities include, general academic questions, exploring degrees, finding interesting/required classes, avoiding course schedule overlap, updates for waitlisted classes, degree, class, or teacher reviews, custom AI coursework assistants, and career and resume assistance.

Figure 3

Let's say you had to pay a fee per semester for unlimited usage of the tool. Would you still be willing to use it?
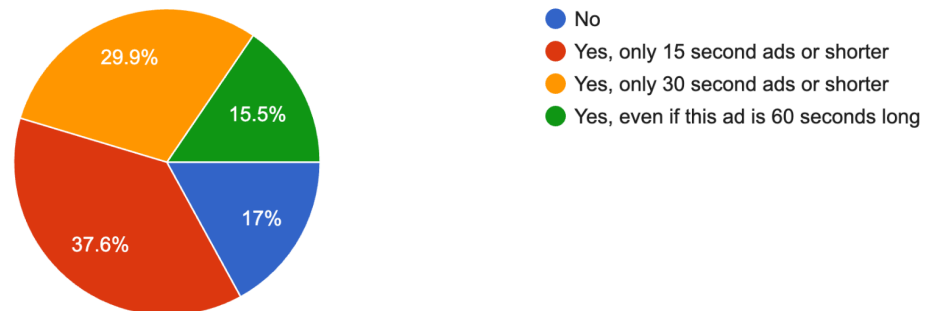194 responses

Respondents were asked if they would be willing to pay a fee to use the tool, and if so, how much. Over seventy percent of respondents said they would only use the tool if it were free.

Figure 4

Let's say you had to sit through an advertisement every once in a while in order to use this tool. Would you still use it?
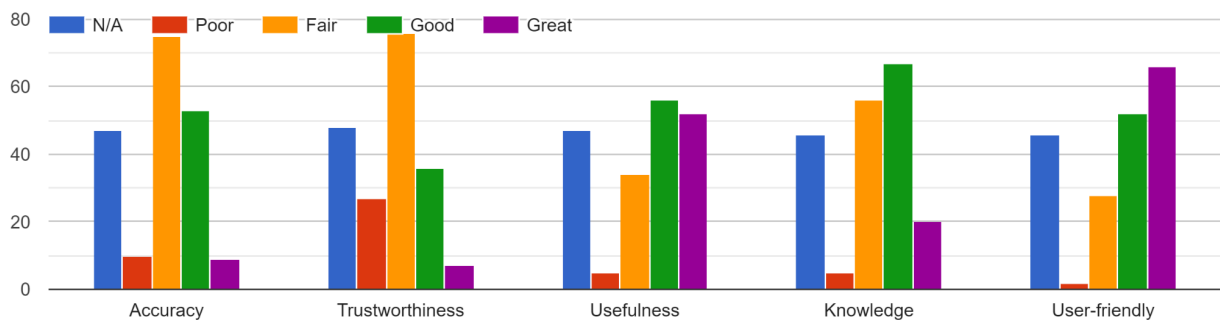194 responses

We gauged users' openness to view advertisements and how long they would view advertisements during tool usage. Over half of respondents believed that they would be ok viewing advertisements that are thirty seconds or less.

Figure 5
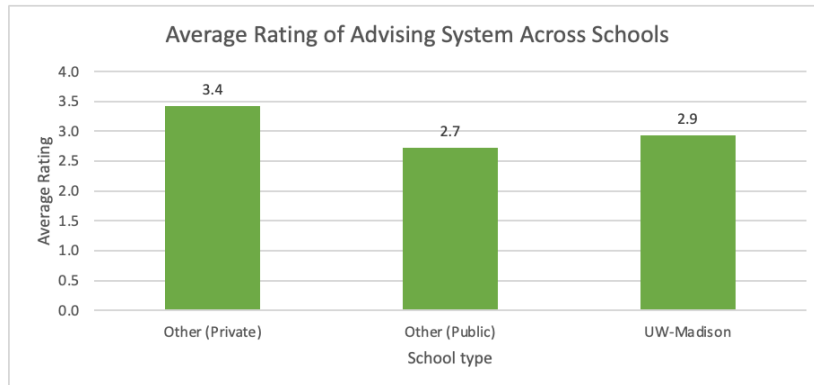
Respondents were asked to rate the overall advising system at their school. Answers were averaged depending on school type with private universities scoring the highest at 3.4 /5 and other public universities scoring the lowest at 2.7 /5.

Figure 6

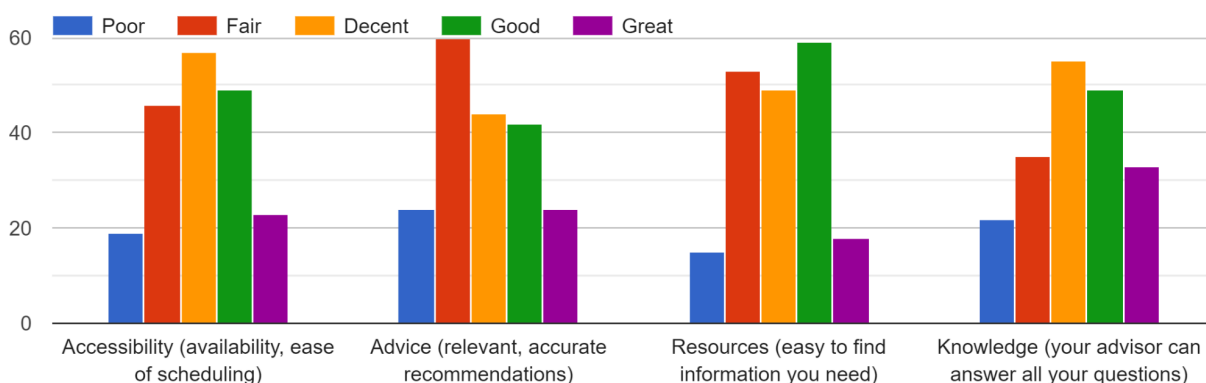Respondents were asked their experience with AI chatbot tools for multiple characteristics like accuracy, trustworthiness, usefulness, knowledge and user friendliness. The lowest experience rating was trustworthiness and the highest score was user friendliness.

Figure 7
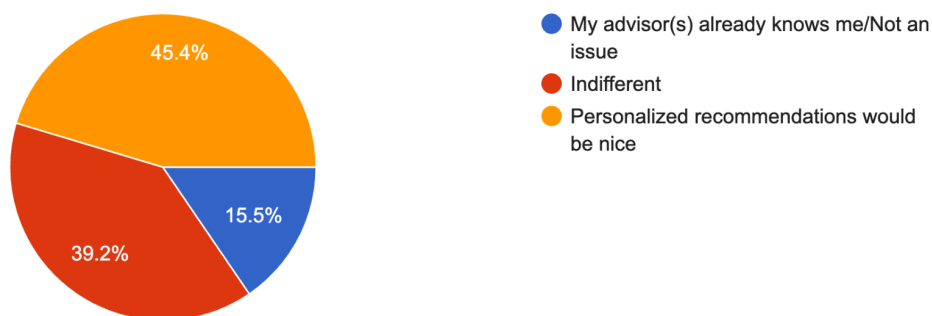
Rate the current advising system at your school

Survey results of students rating different aspects of the advising system at their universities.\

Figure 8

Survey results of how much students think their advisor knows about them.

Appendix B - Tables

Table 1

Name	College	Public or Private Institution
Scottie Waterfield	University of Illinois-Urbana Champaign	Public
Sisley Mark	University of Wisconsin-Madison	Public
Cal Kohloff	University of Dayton	Private
Jason Mandel	University of Southern California	Private
Will Layden	University of Providence	Private
Ciara Bean	University of Wisconsin-Madison	Public
Reed Ochalek	University of California-Santa Barabara	Public

Table 2

University of Central Florida	Texas A&M University - College Station	The Ohio State University - Columbus	Florida International University	Arizona State University - Tempe	Utah Valley University	University of Texas at Austin
60,075	53,876	47,106	46,079	46,061	41,262	40,916
Penn State University - University Park	Kennesaw State University	University of Houston	Michigan State University	Purdue University	University of Arizona	University of Minnesota — Twin Cities
40,600	38,973	38,581	38,574	37,101	36,503	36,209
Rutgers University — New Brunswick	University of Cincinnati	University of Texas at Arlington	University of Florida	California State University — Fullerton	University of Illinois at Urbana-Champaign	California State University — Northridge
36,152	35,339	35,064	34,931	34,925	34,559	34,275
Indiana University — Bloomington	California State University — Long Beach	University of Wisconsin — Madison	Florida State University — Tallahassee	Texas Tech University	Texas State University	University of South Florida — Tampa
34,253	33,605	33,506	33,486	33,256	33,230	33,077
University of North Texas	University of Alabama	University of California — Berkeley	UCLA	University of Washington — Seattle	University of California — Davis	University of Maryland — College Park
32,603	32,168	32,143	32,119	31,384	31,162	30,875
San Diego State University	University of Michigan — Ann Arbor	University of Georgia	**Total**			
30,865	30,633	30,166	1,395,692			

38 largest public universities in the United States with undergraduate enrollment over 30,000 students.[9]

9. Lindsay, Samantha. "The 51 Biggest Colleges in the United States." *The 51 Biggest Colleges in the United States*, blog.prepscholar.com/the-biggest-colleges-in-the-united-states.