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Doing more with less: Using AI-based big interview to combine exam preparation and interview practice

H. Kevin Fulk, *Western Carolina University, hfulk@email.wcu.edu*
Heidi L. Dent, *Western Carolina University, hdent@email.wcu.edu*
William A. Kapakos, *Western Carolina University, wakapakos@email.wcu.edu*
Barbara Jo White, *Western Carolina University, whiteb@email.wcu.edu*

Abstract

Faculty members in business schools are called upon to improve college students' study strategies, their preparedness to transition to careers, and their understanding of emerging technologies, such as artificial intelligence (AI). AI is already changing how organizations undertake common activities, such as recruiting, and business majors can expect AI to increasingly affect their careers. Hence, providing these students with experience with AI can enhance their skill sets. We describe students' experiences with two practical AI applications of the tool, Big Interview– exam preparation and job interview preparation- that we integrated into multiple business courses. Interestingly, students experienced these applications as valuable and relatively easy to use, regardless of age, gender, or major. We provide the exercises that we used in these courses and encourage other faculty members to develop additional exercises.

Keywords: Big Interview, Artificial Intelligence, Interview Preparation, Exam Preparation, Active Learning

Introduction

In this paper, we describe our application of an artificial intelligence (AI)-based tool, Big Interview (Skillful Communications, Inc., 2022a) to enhance business students' studying for courses and building their job interview skills. Business schools and their faculty members are seeking to respond to demands to give their students meaningful exposure to AI applications, to better prepare them to respond to how these technologies are already changing the nature of business and work (Xu & Babaian, 2021). These demands co-exist with pressures to address concerns that many college students are not studying effectively (Dunlosky et al., 2013) or building needed skills to transition successfully to careers (Amoroso & Burke, 2018). These demands are accompanied by increased pressures on universities, such as reduced or stagnant funding (Black et al., 2021). This mix of competing demands and pressures means that business schools and their faculty members must do more with less.

We contend that tools such as Big Interview can help business schools and faculty members to meet these challenges. To better understand the potential value of Big Interview to business students we seek to answer this research question: How do students in business courses respond to both the novel use of Big Interview for exam preparation and the more traditional use of Big Interview for interview preparation? This paper describes our approach to incorporating exam and interview preparation activities using Big Interview in core undergraduate business information systems classes and elective upper-level marketing classes. It also presents how students responded to Big Interview as an AI-based tool for exam preparation and interview

preparation. Overall, business students in these courses found Big Interview to be an effective tool to support studying for exams and preparing for interviews.

The remainder of this paper is organized thusly. The next section provides a review of relevant literature in the areas of AI, interview preparation, and exam preparation. The following section describes our study's methodology, beginning with tasks that the student participants performed. Next, this paper discusses the results of this research. This paper concludes by considering the limitations of our study and opportunities for future research.

Background

Prior to describing our application of Big Interview to support studying and interviewing, we examine the literature that serves as a foundation for our work. This includes previous work on AI, as well as college students' approaches to studying for courses and preparation for careers (e.g., job interviewing).

Artificial Intelligence

AI is increasingly an integral part of the technologies on which businesses rely. Varied business processes are being changed by the inclusion of forms of artificial intelligence. For example, in marketing, AI allows for improved sales forecasting and targeting of content to consumers (Elhajjar et al., 2021). In addition, machine learning enables corporate legal departments to reduce the volume of documents that human attorneys must review (Stetzel, 2019). One area that illustrates challenges associated with the incorporation of AI into business processes is human resources. For example, when it comes to hiring, natural language processing algorithms are used to analyze the content of job descriptions semantically and target the resumes of applicants who are the best match for recruiters' expectations in internal and external databases. The "automation of consumption" has become a new reality in today's marketplace (Sheth, 2021) and talent acquisition is no exception. Technology solutions, such as video interviewing are engaged to help evaluate and qualify applicants (Delaney, 2020). The options available for hiring managers in talent acquisition are rapidly expanding.

Research offers mixed results with the use of AI in talent acquisition. Hiring managers continue to rely on more standardized methods and heuristics for candidate selection feeling that automation can be unprofessional, impersonal, and insufficient (Diab et al., 2011). Alternatively, organizations felt that AI-based interviews are more efficient than traditional interviews in terms of cost and time savings and applicants felt AI-based interviews were fair, objective, and more consistent (Kim & Heo, 2021). Ethics and legal implications are at the forefront of research to ensure discrimination and bias are removed from the algorithms (Fernández-Martínez & Fernández, 2020). As scholarly and industry research continue to focus on the development, bias, legality, and optimization of AI-based talent acquisition programs, activities that integrate these programs will help to prepare students for future careers.

The wide-ranging impacts of AI on business processes have led accrediting bodies and prospective employers to encourage business schools to provide college students with relevant exposure to such emerging technologies. For example, the Association to Advance Collegiate Schools of Business (AACSB) has emphasized the transformative power of AI on business and the importance of business schools to provide students with opportunities to develop skills they will need to effectively work as part of AI-enabled processes (Mescon, 2020). Responses to these calls have ranged from faculty members creating individual activities (e.g., case studies) to designing entire courses on AI topics (Xu & Babaian, 2021). We next turn to the complementary topic of how students learn about such topics through studying.

College Students' Studying for Courses

A key obstacle to college students' effective learning of new materials is how they study. This seemingly self-evident claim is supported by a considerable body of research. When faced with studying for exams and other required work, students often study ineffectively (Dunlosky et al., 2013; Putnam et al., 2016). What constitutes ineffective studying? Ineffective studying encompasses both techniques used and timing of studying. Some techniques have been demonstrated to be ineffective, including highlighting materials, summarization, and rereading materials (Ho et al., 2016; Poorthuis & van Dijk, 2021). The timing of studying is also important, as bunch studying (or cramming) tends to be ineffective (Dunlosky et al., 2013). Students who study effectively tend to spread their studying out over multiple points of time and answer questions about the material (Poorthuis & van Dijk, 2021).

An additional factor is the incorporation of active learning. Active learning entails students reflecting on their experiences with the topic, rather than just passively receiving content that is transmitted to them (Mitchell et al., 2017). Active learning is deep learning, as opposed to surface-level learning, and entails being able to understand the material (e.g., applying it to situations in one's life) (Annansingh, 2019). As with the chosen study strategy, the presence of active learning can improve the students' outcomes (e.g., improved scores on exams) (Poorthuis & van Dijk, 2021).

Faculty interested in improving teaching and learning have explored technological solutions that encourage effective studying and active learning. The growing ubiquity of technology solutions in education has increased opportunities for active, effective learning (e.g., reflecting on experiences with technology simulations) (Mitchell et al., 2017). Recent research is encouraging, showing evidence of improved outcomes for college students who have used AI-based tools for reviews of concepts, such as evidence of improved deep-level learning (Tan et al., 2022).

Career Preparation

In addition to learning course material, a key area of importance for students is the preparation for post-graduation careers. Career services, a division in many universities and colleges, offers services to help students determine majors, explore careers, internships, and job search assistance from writing resumes to interviewing and networking skills (Schaub, 2012). Business-related majors have a personality that is interested in flexibility, innovation, risk-taking, change, and living with chaos (Shahzad et al., 2013). Until recently, interview preparation involved qualitative interviews and analysis in classroom exercises (Meertins et al., 2021; Rubens et al., 2020; Saunders, 2016). Other approaches focus on job search methods to help students discover work that aligns with their interests (Morris et al., 2015).

More recently, some business schools have updated curricula to include a variety of career preparation activities through students' tenures rather than limiting them to career services offerings (Crowne et al., 2020). Some classroom assignments focus on creating cover letters, resume writing, and interview role-playing (Layng, 2007, Meertins et al., 2021). Class assignments for interview preparation are more reflective and subjective in nature, however, when students were paired with graduate-level students in "practice-based" assignments, students felt the experience was more realistic (Saunders, 2016).

There is little research focused on integrating AI technologies for career preparation. Extant research focuses on assessments in a healthcare environment involving audio assessments of substance abuse and

student perceptions of the experience (Hohman & Finnegan, 2006). Increasingly, businesses are incorporating AI into their hiring process. Including predictive hiring algorithms in the hiring process is found to be the most useful innovation for interviewing and underscores the impact that AI will have on recruiting (Bongard, 2019). Recently, however, researchers have called for more attention to the use of AI-based, asynchronous video interviewing software, such as Big Interview (Lukacik et al., 2022), and demonstrated their use in helping business students prepare for interviews (Black et al., 2021).

Methodology

We now turn to our approach for incorporating Big Interview into business courses and understanding students' responses to this tool. Big Interview is an interview preparation tool with training videos for users, job-related educational content, and a database of interview questions asked by diverse interviewers of different genders (Skillful Communications, Inc., 2022b). Functionality exists for users to create and record their own interview question videos and create their own evaluation criteria (Skillful Communications, Inc., 2022c). Big Interview also has capabilities for its artificial intelligence tool to review user interview responses, with respect to multiple criteria (e.g., um counter, power words, and eye contact) (Skillful Communications, Inc., 2022d). However, Big Interview's AI tool does not provide feedback on user-created criteria or on the actual content of the user videos (K. Christian, personal communication, July 12, 2022). Big Interview offers affordable yearly institutional licenses with 2022 prices ranging from approximately $3,000 to $13,000, depending upon full-time student enrollment numbers.

A survey (see Appendix A) was used to measure student responses to Big Interview activities involving job interview preparation and exam preparation. The survey was administered to 14 sections of business courses in both information systems (11 sections) and marketing (3 sections) taught during the Spring 2022 semester. Eleven sections were taught face-to-face and the other three sections were taught online.

There were more students completing the exam preparation Big Interview assignment and survey (52%) than students completing the interview preparation Big Interview assignment and survey (48%). There were more males (50%) than females (44%) or no gender noted (6%).

Table 1. Demographics

Exam Preparation		
Gender	**Major**	**# of Survey Responses**
Female	CIS Majors	2
	Non-CIS Majors	33
Male	CIS Majors	9
	Non-CIS Majors	27
No Gender Noted		4
Exam Preparation Total Students		75
Interview Preparation		
Gender	**Major**	**# of Survey Responses**
Female	CIS Majors	1
	Non-CIS Majors	27
Male	CIS Majors	4
	Non-CIS Majors	31
No Gender Noted		5
Interview Preparation Total Students		68

Total Students - Overall	143

The Big Interview activities consisted of two parts. The first part represented the video assignment where students were tasked with recording video responses to four questions that involved either exam study guide questions or job interview questions (see Appendix B). The order of the questions asked in the activities alternated between male and female voices where two of the questions were asked by one female voice and the other two questions were asked by a male voice. None of the recorded questions were asked by the instructor, but rather by other business professors. For each class section, a Big Interview access code was generated that students used to record their video responses to the questions.

In the second part of the activity, students were tasked with completing the rest of the Big Interview assignment (see Appendix C). The assignment involved students reviewing their artificial intelligence score (gold, silver, or bronze) that was generated by Big Interview for each of their recorded responses (see Figure 1 below) and an overall badge (gold, silver, or bronze) for all four responses.

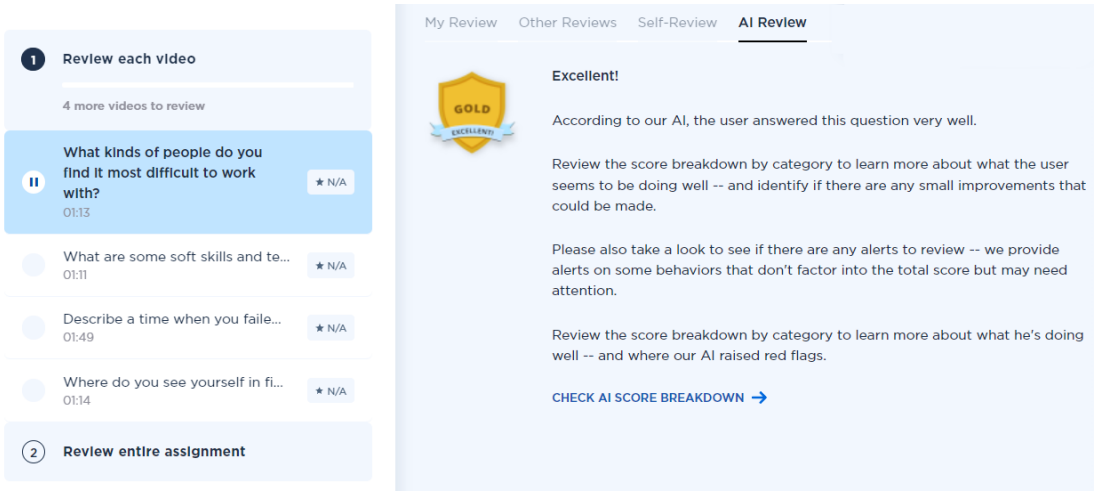


Figure 1: Example of AI Review of Recorded Response in Big Interview

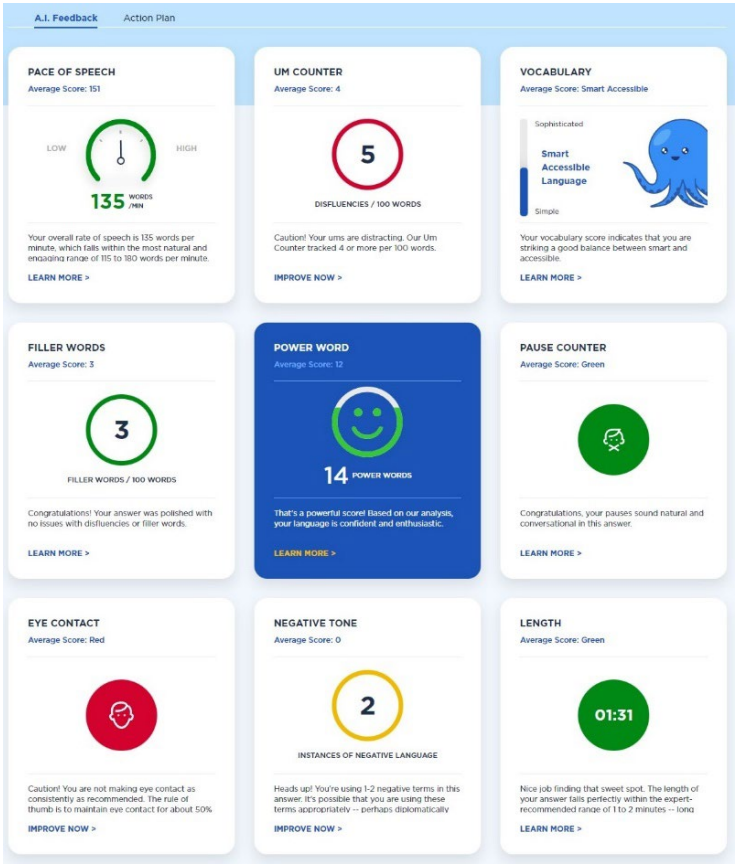
Students also had the opportunity to view their artificial intelligence score breakdown that provides personalized feedback on criteria such as pace of speech, um counter, vocabulary, filler words, power words, pause counter, negativity tone, length, authenticity score, volume, and lighting. Students could also view a tailored action plan which is also included for each criterion and offers suggestions and recommendations on how to improve where the artificial intelligence tool raised red flags (see Figure 2 on the following page). Finally, we asked students to reflect on their use of Big Interview and how using it compared with how they typically performed the tasks (interview preparation or exam preparation).

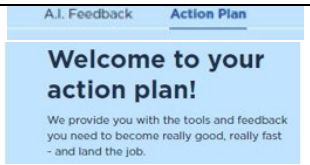
Results

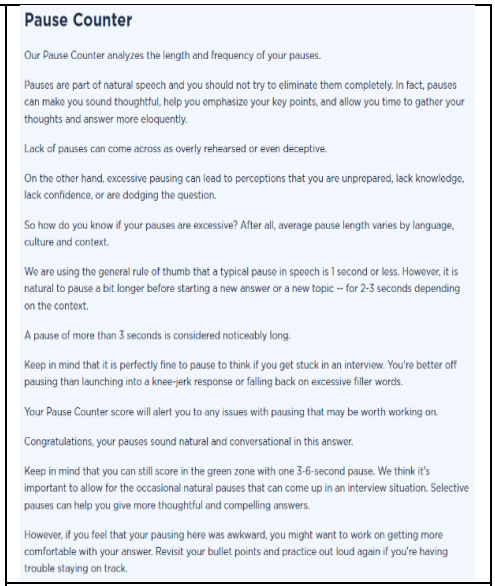
A total of 172 students completed the survey; however, not all students completed both the video assignment and the survey. Student surveys were not included in the sample set if they didn't complete the videos at all or if their videos were too short to be reviewed by Big Interview's AI tool, which requires a video length of 30 seconds or more. If students took the survey more than once in the same class, or if they completed assignments in multiple classes, the second survey was deleted. Surveys were also excluded if students chose the wrong class section which resulted in their receiving the wrong question sets. A total of 29 surveys were excluded, leaving 143 surveys in the sample.

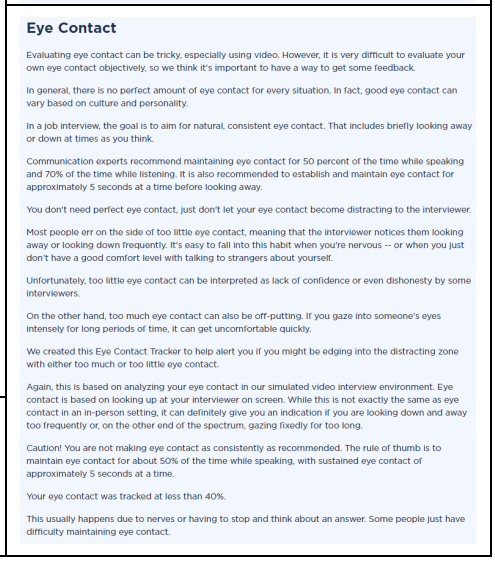
A one sample T-test showed that overall, students liked using Big Interview for exam preparation (M = 4.36, SD = 1.85), $t(74) = 1.69$, $p = .048$ compared to using written review questions. However, students did not find Big Interview significantly easier to use compared to written review questions (M = 4.32, SD = 1.81), $t(74) = 1.53$, $p = 0.065$. Similarly, there was not a significant difference in the time spent on exam preparation using Big Interview over using written review questions (M = 3.96, SD = 1. 75), $t(74) = -0.20$, $p = 0.422$.

AI Score Breakdown: Nine Areas of AI Feedback









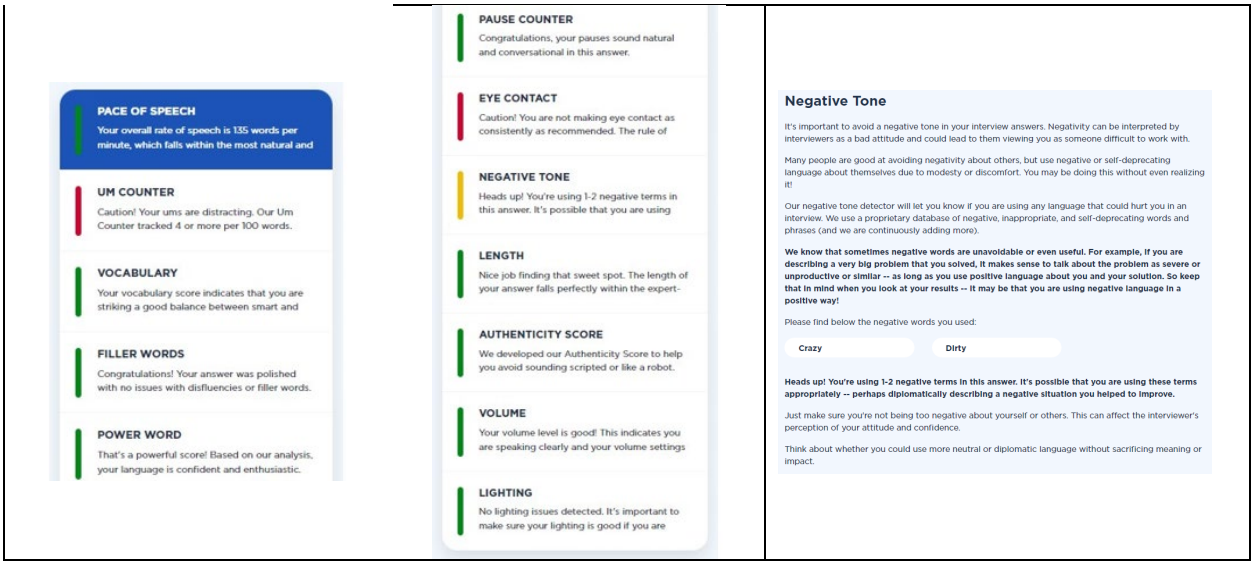


Figure 2: Example of AI Review Breakdown (AI Feedback on 9 Criteria), AI Action Plan, and Sample Comments for Three Action Plan Items (Pause Counter, Eye Contact, and Negative Tone)

On the other hand, students overall reported learning more using Big Interview ($M = 4.49$, $SD = 1.83$), $t(74) = 2.34$, $p = .011$ compared to written review questions. Finally, students thought Big Interview was accurate in the feedback provided by its Artificial Intelligence tool ($M = 5.61$, $SD = 1.38$), $t(74) = 10.09$, $p < .001$ and students overall thought Big Interview helped prepare them for interviewing for jobs in the future ($M = 5.44$, $SD = 1.63$), $t(74) = 7.65$, $p < .001$.

While students had positive perceptions about using Big Interview for exam preparation, their perceptions about using Big Interview for job interviews, its designed purpose, were even more positive. Students overall liked using Big Interview ($M = 6.25$, $SD = 1.30$) more than completing a written research report on interviewing for jobs, $t(67) = 14.30$, $p < .001$. Students thought Big Interview helped them learn more ($M = 6.26$, $SD = 1.23$) than a written research project, $t(67) = 15.19$, $p < .001$ and students spent significantly more time using Big Interview ($M = 4.69$, $SD = 1.93$) compared to what they would have spent on a written research project concerning job interviews, $t(67) = 3.00$, $p = .002$. Additionally, students found Big Interview easier to use ($M = 6.18$, $SD = 1.34$), $t(67) = 13.42$, $p < .001$, accurate in its results ($M = 6.06$, $SD = 1.21$), $t(67) = 14.10$, $p < .001$ and helpful in preparing for job interviews in the future ($M = 6.18$, $SD = 1.22$), $t(67) = 15.70$, $p < .001$.

There were no significant differences for gender, age or whether students were information systems (IS) majors for survey items related to either the exam preparation or job preparation interviews and assignments. For students completing the exam preparation treatment, compared to using written review questions, face-to-face students liked using Big Interview ($M = 4.77$, $SD = 1.69$) more than online students ($M = 3.81$, $SD = 1.94$), $t(73) = -2.27$, $p = 0.130$. Similarly, compared to using written review questions, face-to-face students using Big Interview spent more time ($M = 4.28$, $SD = 1.78$) compared to online students ($M = 3.53$, $SD = 1.65$), $t(73) = -1.86$, $p = .033$).

Additionally, qualitative responses provided by participants offer additional insights into students' experiences with using Big Interview. Consider the following examples (in italics):

"Big Interview was easy to use and fun. The results in the review were accurate and really helped me to think about interviews."

(Information Systems student)

"I love the project and encourage the creators to keep developing it, because it did help me."
(Non-Information Systems student)

"I found it very cool how the A.I tool keeps track of how many times you say "um" and how fast/slow you talk. It keeps track of various aspects of the verbal response which are accurate in assessing the quality of the response."
(Information Systems student)

"I usually give myself a couple days in advance to study, but I usually end up not retaining as much information as I intend to, still spending a couple of hours each day studying. With this being an interview and not having that time I was able to take a couple of minutes to analyze my answer and give the best context I could whilst keeping it short and consistent. I believe taking this time away was helpful in a way that it was able to make me think a different way...."
(Non-Information Systems student)

Students' responses highlighted the value of Big Interview. Importantly, even students who used Big Interview for exam preparation saw its value for helping them to prepare for interviews, in addition to helping them prepare for exams.

Discussion

In this paper, we have explored the multiple challenges facing business schools and professors. We have proposed our application of Big Interview as a tool for addressing these challenges. Big Interview (and other asynchronous video interview tools like it) are not "silver bullets" but they do show true potential to help business schools and their faculty members to address challenges that they face. A key insight of our study is that Big Interview can simultaneously help to prepare college students for exam preparation and interview preparation. This double-pronged capability may stem from this tool's designed-in functionality (interview preparation) and its inherent flexibility. This flexibility enables its users to create questions regardless of the topic. An illustration of this flexibility is the use of Big Interview by health care faculty to create questions that simulate pharmacy students' interactions with patients (Hope et al., 2021).

While results showed that students preferred exam preparation using Big Interview compared to written review questions, it is possible that students simply prefer the novelty of answering exam preparation questions using Big Interview's video response system with AI feedback compared to more traditional written methods. Previous research on leaders modeling desired behaviors for employees (Brown & White, 2009) highlighted that novelty affects perception because it draws attention. Their experiment showed that using novel technologies over older technologies was significant only when leaders also modeled the new behaviors. In this current study, professors modeled the expected behaviors by recording the questions in a professional manner and dress against a light background. Interestingly though, we did not have students' own professors "ask" them questions using Big Interview and it is not known whether students knew the other "interviewers" were other professors in the college of business. It is also unclear whether students would have preferred the novel technology more if their own professors asked the interview questions.

Conclusion

As with all research, the current study has multiple limitations that provide opportunities for future work. First, we examined only two use scenarios for Big Interview: interview preparation and exam preparation. We encourage business school faculty members to examine additional use scenarios. For example,

information systems faculty members who assign students to complete a group development project could use Big Interview to allow those students to practice responding to questions from their project's sponsor. Second, we limited our study to only one AI tool and, so, were not able to compare students' reactions to multiple such tools. Researchers seeking to build upon our work should undertake a comparative study to examine the effectiveness of multiple such tools. Finally, we did not ask students to engage in peer review of other students' responses to the questions deployed on Big Interview. Using this capability within Big Interview may have provided students with a richer learning experience. We encourage other researchers to use this capability to improve Big Interview's implementation in their classes.

We welcome other faculty members in business schools and beyond to build upon our experiences using Big Interview. The assignments that we used can provide a useful starting point (see Appendix C). We are confident that this future work can create a more robust set of tools for meeting the challenges of effectively preparing business students for their future careers.

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Appendix A: Survey Items

The survey asked demographic questions regarding age, gender, and major. The following items were also included (see Table 2 below):

Table 2. Survey Items
(7-point Likert Scale: 1=Strongly Disagree; 7=Strongly Agree)

Big Interview (With Artificial Intelligence) and Job Interview Preparation
1. I liked using Big Interview with Artificial Intelligence for job interview preparation more than I like completing job interview research project.
2. Preparing for my job interview using Big Interview with Artificial Intelligence helped me learn more about the interview experience than completing a written job interview research project.
3. I spent more time on job interview preparation using Big Interview with Artificial Intelligence than I would have completing a written job interview research project.
4. It was easier to use Big Interview with Artificial Intelligence for job interview preparation compared to completing a written job interview research project.
5. Big Interview's Artificial Intelligence tool was accurate in its reviews of my video responses
6. This assignment has helped prepare me for interviewing for jobs in the future.
Big Interview (With Artificial Intelligence) and Exam Preparation
1. I liked using Big Interview with Artificial Intelligence for exam preparation more than I like using written review questions
2. Preparing for my exam using Big Interview with Artificial Intelligence helped me learn more about the exam material than preparing using written review questions.
3. I spent more time preparing for my exam using Big Interview with Artificial Intelligence than I would have using written review questions.
4. It was easier to use Big Interview with Artificial Intelligence for exam preparation compared to using written review questions
5. Big Interview's Artificial Intelligence tool was accurate in its reviews of my video responses
6. This assignment has helped prepare me for interviewing for jobs in the future.

Appendix B: Big Interview Questions

Questions recorded by professors included:

Interview Questions

1. Where do you see yourself in five years?
2. What are some soft skills and technical skills you would bring to the workplace?
3. What kinds of people do you find it most difficult to work with?
4. Describe a time when you failed and how you worked through it.

Exam Preparation Questions for Exam A

1. Describe the four characteristics of big data that begin with the letter "V".
2. Tell me about the three categories of analytics (descriptive, predictive, and prescriptive).
3. Describe how decisions differ at the strategic level, the managerial level, and the operational level and which different types of information systems can aid each level of manager.
4. Tell me about the four types of data mining techniques (estimation analysis, cluster analysis, affinity grouping analysis, and classification analysis).

Exam Preparation Questions for Exam B

1. Tell me about the 7 Systems analysis and design stages and describe one or two stages in which you might interact with IT employees so that systems will be more successful.
2. What do you see as the advantages or benefits of outsourcing? You can also describe any challenges.
3. What are the seven characteristics of agile infrastructures?
4. Describe the four benefits to businesses of high-quality data.

Appendix C: Typical Assignment Instructions

Assignment Background
Big Interview provides for video response reviews (My Review, Other Reviews, Self-Review, and AI Review) corresponding to instructor, peer, self- and AI review of each video response according to various criteria (see Figure 1). However, with several video responses per student and class sizes of up to 50 students per class, instructor review is not feasible and incredibly time-consuming. Therefore, assignments below were designed for the automated AI to review each video in place of the instructor, who instead reviewed a very short half-page reflection, which can be graded quite quickly.

Interview Preparation Assignment
Part 1: Complete your Big Interview assignment FIRST. Your Big Interview code is: #####

Part 2: Before you start your Big Interview Reflection, be sure to log in to Big Interview again and click the AI Tab underneath your video to review your overall rating (Gold, Silver, or Bronze) by Big Interview's AI tool. Then click the blue link "Check AI Score Breakdown" to get personalized feedback on criteria such as pace of speech, um counter, vocabulary, filler words, power words, pause counter, negativity tone, length, authenticity score, volume, and lighting.

Include the following in your approximately ½-page write-up: 1) A short intro and conclusion, 2) One section describing your experience with previous unpaid or paid job position interviews (How do you typically prepare for interviews and how did you perform on previous interviews?), and 3) One section describing your experience using Big Interview Software (Was it easy to use?) and its Artificial Intelligence tool (Did Big Interview's AI tool provide accurate feedback on your video response performance?

Format: Word Doc only; double-spaced with 1-inch margins. Watch for grammar, typos, and spelling errors.

Exam Preparation Assignment
Part 1: Complete your Big Interview assignment FIRST. Your Big Interview code is: #####

Part 2: Before you start your Big Interview Reflection, be sure to log in to Big Interview again and click the AI Tab underneath your video to review your overall rating (Gold, Silver, or Bronze) by Big Interview's AI tool. Then click the blue link "Check AI Score Breakdown" to get personalized feedback on criteria such as pace of speech, um counter, vocabulary, filler words, power words, pause counter, negativity tone, length, authenticity score, volume, and lighting.

Include the following in your approximately ½-page write-up: 1) A short intro and conclusion, 2) One section describing your experience exam preparation (How do you typically prepare for exams and how much time do you typically spend preparing for exams? What did you think about verbally responding to exam review questions using Big Interview? Was it helpful?), and 3) One section describing your experience using Big Interview Software (Was it easy to use?) and its Artificial Intelligence tool (Did Big Interview's AI tool provide accurate feedback on your video response performance?

Format: Word Doc only; double-spaced with 1-inch margins. Watch for grammar, typos, and spelling errors.