Research in Efficacy and Acceptance of AI in Presentation Skills Development in an Educational Setting

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Peter currently teaches full-time at the University of Bridgeport in the Technology Management Department. He also is an Adjunct Professor at Fairfield University in the Dolan School of Business. For the second half of his career Peter had leadership roles at Crotonville, GE's Leadership Development Center, which served GE's global employee base of 320,000 employees and widely considered to be the cultural epicenter of the company. Ultimately, he was the Senior Leader – Global Crotonville Delivery. In this role Peter led the Crotonville learning experience delivery world-wide, including the Crotonville NY Campus and was responsible for a $85M operating budget. Peter led the 4-year 'Reimagining Crotonville' Project, which focused on integrating the content, experience, and environment to create a transformative learning experience. Along with expanding and updating the entire campus, the $100M+ capital improvement project enabled more creative and impactful learning experiences. In 2016 he was appointed to lead a cross-functional, adaptive team to develop a contemporary working/learning environment in GE's HQ in Boston

Prior to his role at Crotonville, Peter had assignments in GE Appliances, GE Aviation, GE Industrial Systems, and GE Supply. He has held positions of increasing responsibility in Manufacturing, Engineering, Product Management, Marketing and Sales. Peter earned his Master Black Belt certification in the at GE Supply, completing projects in sales force effectiveness, growing sales at large industrial customers, and developing processes to improve operations at local branches.

Peter presents and lectures in multiple industry and academic settings on how learning can drive transformation of individual performance and culture. He is also an executive coach with a focus on helping individuals align their passion, skills, and values to bring their best self to their work.

Peter is married, his spouse, Eileen, is a Senior Finance Executive. Peter and Eileen are supportive of each other as a dual-career household with four children.

Exploratory Research in Efficacy and Acceptance of AI in Presentation Skills Development in an Educational Setting

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Abstract—AI can be applied to many aspects of behavioral change coaching. Because AI is a developing field, little research has been conducted to understand the efficacy and the acceptance of developmental suggestions by an AI Coach.

Communication skills are an important component of the broad behavioral skills required to be successful in both technical and non-technical domains. People develop verbal and written communication skills through practice and constructive feedback, often in the form of coaching. An AI coach can provide specific metrics on generally accepted measures of effective presentation: Pace, Number of Pauses, Eye Contact, the use of filler words or repeated words, volume control, and sentiment. The user receives feedback on their session results along with the recommended range for optimal communication effectiveness.

AI has the potential to make the development of communication skills more accessible to more people so they can achieve their communication skills goals. This research explores the efficacy and effectiveness of coaching suggestions from an AI Coach to help students and young professionals improve their oral communication skills.

The primary goal of this research is to develop a methodology that could be used to test the efficacy of AI in developing communication skills. A secondary goal for the research is to understand better what factors impact the acceptance of the recommendations and the impact on the efficacy. The value of AI in behavioral intervention coaching could be extended to other areas of skill development as AI improves and clients become more comfortable with the feedback provided by the AI tool.

The AI Coach being used in this research is Edy, a publicly available AI Coach from EdMyst.

Keywords—AI Coaching, Presentation Skills Development, Behavior Modification Coaching

I. INTRODUCTION

A. AI in Skill Development

AI has the potential to revolutionize behavioral change coaching. However, research is still being explored regarding the efficacy and acceptance of AI coaching interventions in this domain. This study seeks to assess the effectiveness of AI coaching, focusing on its role in improving presentation skills among students and young professionals.

There are three intersecting areas of interest in this study, Coaching, behavior modification through AI coaching, and Communication.

B. Why Presentation Skills

This study focuses on a specific behavioral change, presentation skill development [1]. Presentations are indispensable in various contexts, facilitating effective communication, knowledge dissemination, and professional advancement.

Traditional methods of learning presentation skills entail observation, formal training, and practice. Despite these efforts, individuals encounter challenges such as anxiety, organizational difficulties, delivery issues, and visual design constraints [2]. Overcoming these challenges necessitates deliberate practice, constructive feedback, and continuous refinement to deliver impactful presentations that engage, inform, and persuade audiences effectively.

Several factors may increase the acceptance of any coaches' suggestions, AI coach or human coach [3]. If the coach provides evidence-based evaluation and recommendations the client is more likely to accept and trust the guidance provided. If the coach is consistent with other expert opinions that the client has received, the client will be

more likely to view them as credible and valuable. Personalization and transparency of recommendations set coaching apart from other forms of skill development, which is important for both AI and non-AI coaches. If the user has a positive experience with the coach, they are more likely to accept and act on the suggested improvement. For all coaches, clear and precise communication is important for effectiveness. Client control of pace of suggestions making feedback more gradual (incremental) can increase effectiveness. For AI coaches, the challenges manifest in creating the interaction protocol, not merely the application of AI [4].

The AI Coach has different strengths than a human coach. AI Coaches can analyze and deploy vast amounts of data, but just like the human coach, how that data is presented can make the difference between a suggestion that is accepted, and the resulting skill improvement and the suggestion not being accepted and missed opportunity to improve that skill [5][6].

II. METHODOLOGY

This research project's participants are graduate students in business and technology. The opportunity to participate in the study was presented in four graduate classes in the summer of 2023. The instructor for each of the classes gave the students time at the end of a class to move to a private room to complete the steps of the study. The instructor could not determine if a student participated in the study or not. A total of 50 students were offered the opportunity to complete the study.

A. Background

Each participant was given a specific user name and password that they would use for all components of the study. The study data collection consisted of two parts, the first part consisted of a survey that was given at the beginning and end of the study. The user name enabled comparison between pre- and post-study surveys. We were able to identify and connect 10 participants' pre and post-survey responses. The second part of the data collection effort was inside the Edy AI Coach tool, the participant was given a survey after each coaching session to gauge their impression after the session. The participants used the same user name in the Edy Tool as they did for the pre-survey and post-survey.

B. Protocol for Study

Figure 1 shows the protocol for the study participants.

C. User Experience

Users had the opportunity to create their own script or have AI help craft a Script for them. The video sessions could range from 30 seconds to two minutes.

At the conclusion of each session, the user would receive a dashboard that looks like Figure 2. In the interface, the green section serves as a visual cue for the optimal range, while the red highlights areas where improvement is advised. When the user interacts with the "Pace" function, the pace graphic is displayed, and similarly, clicking on "Pause" reveals the pause graphic, and so forth. Of the 22 students who completed at least one session,

10 students recorded more than one video and completed both the pre and post survey.

1. Obtain a username/password for the study.
2. Complete a Pre-Survey (10 questions) via Survey Monkey, using a username.
3. Complete the following steps using AI Coach Ap Edy
a. Log into Edy,
b. Record a one-minute video on Edy,
c. Review Edy's recommendations,
d. Complete a three-question perception survey.
e. Repeat 3b-3d five times.
4. Complete an (8 question) Post-Survey via Survey Monkey using username.

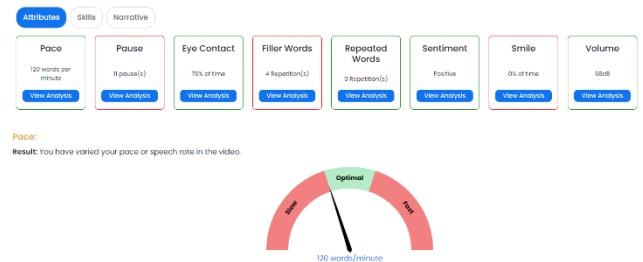Fig. 1. Protocol for Study Participants

Fig. 2. Example of dashboard provided by Edy after coaching session

We did not include time duration for the video session as a variable in the data collection plan. The Edy AI Coach records various metrics for each session, including Pace (measured in words per minute), Pause (count of pauses), Eye Contact (percentage of video duration), filler words (quantity used), repeated words (number of repetitions), smile (percentage of time smiling), and volume control (measured in decibels). Additionally, Edy captured the answers to three questions for each session. These questions were: 1) I understand the suggested improvements from the AI Coach. 2) I can apply the suggested improvements in my next session and 3) I feel this session's result were about the same as my expectation. Each of these questions was answered with a 1-5 Likert scale, one being Strongly Disagree, to five being Strongly Agree. There were 10 variables from the pre-survey and 8 variables from the post-survey. As illustrated in Table 1 below, 50 participants were invited to participate in the survey, of which 20 completed the coaching session, and 10 successfully completed both the Pre and Post Survey in conjunction with the Edy session.

We only included data for analysis where a participant had more than one session with Edy and completed both the pre and post survey. There was data from 12 Edy User sessions data that could not be used due to the lack of a pre or post survey. The reasons behind certain individuals choosing not to participate in the study remain unknown. Potential hypotheses include challenges related to accessing suitable technology, finding a private area to conduct the study, or encountering difficulties in following the research protocol. Some users did express difficulties in accessing technological tools, such as a laptop computer. We suggested that they use a laptop instead of a smartphone due primarily to the consistency of participant experience. No participant expressed to the researchers that they opted out of the study because the coaching would be provided

by an AI Coach, in fact, many participants reported being intrigued with the possibility to practice presentation skills and get suitable feedback.

TABLE I.   SUMMARY OF RESPONSES

Participants	Number
Solicited	50
Completed Coaching Sessions	22
Completed Pre/Post Survey	10

III. RESULTS

A. Demographic

All the participants were between 18 and 35. Eight were between 18-25 and two were between 26 and 35. All had completed a 4-year degree and eight had completed a Graduate Degree. All ten participants completed their undergraduate degrees in India. Half of the participants reported that English is their primary language for oral communication. Four reported their primary oral language is Telugu and one person indicated that their primary oral communication language is Kannada. No correlation was found between the primary oral language and satisfaction with the AI Coaches' suggestion.

B. User Survey Responses

Users had the opportunity to choose their own script or have AI help craft a Script for them. 70% of respondents reported using the suggested AI script for their interview preparation, while 10% utilized their own words exclusively. 20% of participants referred to both the AI script and their own terms during interview preparation.

Most participants reported that they felt that they had not received feedback on their oral communication before this study and when they had been given feedback, most of the participants indicated that they felt successful in applying feedback on oral communication. Overwhelmingly the participants indicated that they were open to receiving feedback from an AI Coach and felt that an online AI coach could help them become better communicators. Importantly, all study participants reported wanting to improve their oral communication skills.

Participants believed the AI coach helped them improve their communication skills. As evidenced by the following data points:

- Participant satisfaction with improvements they experienced post-session were 4.6 out of 5, with over half rating a 5 out of 5.

- All participants agree or strongly agree that and online AI coach can help them become a better communicator

- All participants agree or strongly agree that they would continue to utilize the AI Coaches' Suggestions in the future.

- 9 of 10 participants agreed that they improved their oral communication skills as a result of the sessions, one participant was neutral.

C. Comparison between Survey and Edy Results

The objective data from Edy did not always correspond to participant self-assessment. In many cases the participants reported that they believed they acted upon the AI coaches' recommendation, however, the result was inconclusive, sometimes improving and sometimes not improving.

Eye contact, for example, is interesting in that if a participant started with a 100% rating on eye contact, they were able to maintain that eye contact rating versus improving the rating. In this case, the AI coach was affirming their skill vs developing that skill. If they started with a lower eye contact rating, there may not be a direct continuous improvement to a 100% rating. Participant 13 started with 61 percent eye contact and attained a rating of 95% by the third session however in their next session they fell to 74% and increased to 87% on their last round of coaching. This is expected in that behavioral skill development is not linear.

The concept of enhanced verbal communication skills holds significant weight, with 80% of participants reporting a beneficial impact. This suggests that AI-guided presentation skills development is perceived effective in this study. Table 2 indicates the strong belief of the participants that they will use AI Coaches' suggestions in the future.

IV. DISCUSSION

Analysis of the results was more difficult than anticipated. First, the decision to only analyze participants who completed all parts of the study limited the sample size of the study. Due to the exploratory nature of this study, the researcher believes that the themes and findings are significant even though the final sample size was small. This study should be repeated with a larger population and sample size. Several suggested insights will improve the future iterations of this study.

A. *Evaluating AI Coach Effectiveness in Presentation Skill Development.*

1) The seven distinct presentation skills/attributes made it difficult to determine if indeed someone was improving their presentation skills. For example, if someone improved pace, but used less eye contact, it isn't clear that is a demonstrated improvement. The researcher is looking at ways to combine the different ratings to create an 'equation' of presentation skills. That is, the skill 'rating' would be a mathematical function of each one of the individual skill data points.

TABLE II.   ANALYSIS OF PRESENTATION SKILL IMPROVEMENT

Category	Participants	*Future Use of AI Suggestions*
Mixed Results	20%	Agree/Strongly Agree
Improved Results	40%	Agree/Strongly Agree
Maintained Good Performance	40%	Agree/Strongly Agree

2) Another critical insight is that we did not capture participant intention at a granular 'skill' level. A participant could be focused on a specific attribute, such as pace. We did not capture the intention, therefore we don't know if their intention was successful. Future studies will include intention at a more granular level. Comparing AI coaching to Human Coaching in skill development, a human coach could appreciate the focus on the specific skill and recognize if the focus yielded an improved result. The human coach would likely notice and highlight the fact that the focus of the session was on one particular attribute and have a corresponding focus on the analysis and feedback. That is, the results for the non focus attributes would be given less priority than that focus attribute for that session. The AI coach is not yet able to discern motivation for different behaviors that improve presentation skills. Future studies should capture the intent for improvement before the video session.

3) A third insight is that the attributes are measured by AI with incredible precision, but it is unclear whether that precision is relevant to the student trying to improve. Is 154 words per minute a relevant improvement when compared to 159 words per minute? There are directional indicators that may not be apparent in the precision of the data. The dashboard shown by Edy to the user is an attempt to mitigate the 'drowning in detail' phenomenon. A fertile area of study will be how much detail to provide in the recommendations from an AI coach to have maximum development.

The perception of improvement in oral communication skills is notable, with 80% of respondents reporting a positive impact. This suggests that AI-guided interview preparation can be effective in enhancing these skills.

V. CONCLUSION

Despite these limitations, preliminary findings suggest the potential of AI coaching in improving presentation skills among participants. The analysis of data from surveys and Edy's feedback provides valuable insights into the effectiveness of AI coaching interventions in this domain. While developing findings about the perception of AI coaches, this exploratory study raises additional questions about how to measure the efficacy and impact of AI in the development of presentation skills.

Creating a generalized 'number' that brings together the most important skills to develop for improved presentation. A meta-study of existing research that describes presentation skills could aid in the creation of a presentation score, much like 'sleep' score on a biometric device. The development of an equation that provides the 'presentation score' would aid in comparing results across tools and participants. Also the 'presentation score' could be compared to actual human coach raters and improve the impact of the AI coach.

This exploratory study provides a foundation upon which to further explore the specific mechanisms through which AI coaching influences skill acquisition and maintenance. This study explored the session to session growth over a short period of time (sessions separated by minutes). Future exploration could be done for over a extended period of time(sessions separated by days).

The AI Coach could be compared to either self practice (via a mirror) or to a human coach. Practicing in front of a mirror is always accessible and provides the opportunity to self evaluate the improvements. However practicing in front of a mirror would not provide the quantitative feedback that the AI coach provides. This study would need to have participants do both the mirror and AI Coach practice to eliminate variation in participant skill levels affecting the study outcome. Comparing the improvement based on the suggestions of an AI coach and the suggestions of a human coach may elicit which techniques that could be used to make both an AI coach and a human coach more effective [7] [8].

VI. ACKNOWLEDGMENTS

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