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A Pandemic Pivot Podcast

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Abstract

In mid-2021, with COVID-19 restrictions persisting in preventing face-to-face outreach activities, Mason's Department of Mechanical Engineering embraced podcasting as a means to engage with pre-college, college, and graduate-level students and researchers. This paper describes the objectives in the development of the podcast, selection of podcast guests, logistics of podcast launch, engagement metrics, and leveraging of department social media to promote the podcast effort. Lessons learned are provided for those interested in pursuing similar endeavors at a department/unit level.

Keywords

Podcast, COVID-19, outreach

Introduction

With the onset of the COVID-19 pandemic, most STEM outreach activities pivoted to virtual delivery, or were cancelled altogether. The Department of Mechanical Engineering at George Mason was seeking innovative ways to continue to advance our goals for engaging with a diverse prospective and current student population. Along the same lines, we had external support to encourage activities to increase awareness and participation in naval STEM programs at the K-12, University, and faculty levels.

Podcasts have become an increasingly important tool for sharing information. Drawing upon data and publications from 2020, the podcast audience was forecast to double by 2023[1]. Of the U.S. population ages twelve and older, 37%, or an estimated 104 million people listened to a podcast in the last month, more than double the percent of listeners in 2015 (17%)[2]. Of the U.S. population ages twelve and older 24% listened to a podcast in the last week, and of those listeners, the average time spent listening to podcasts per week was 6 hours and 39 minutes[2]. Podcasts have proven a particularly effective tool during the COVID-19 pandemic[3]. And similarly, the Navy has embraced alternative modalities for STEM outreach as highlighted by the recent Naval Horizons initiative[4].

Execution

For the initial run of the podcast series, we aimed to develop 10 episodes, eight of which have been released as of this writing. A variety of recording formats were utilized in reflection of the evolution of pandemic-related restrictions, from zoom to face-to-face interview to seminar recording. The audio recordings were edited as needed for podcast suitability, and uploaded to the podcast hosting service Anchor which enables dissemination via major podcast distribution platforms (Spotify, Apple Podcasts, Google Podcasts, etc…)[5]. Largely this effort was conducted with minimal cost leveraging equipment and software utilized for distance instruction.

The intent with the podcast was to broadly serve the department's outreach goals. More specifically, the podcast also permitted us to continue ONR-supported naval STEM outreach that otherwise may have been paused due to pandemic. Within the ONR-supported effort, we sought to:

- Increase participation of Northern Virginia K-12 students in naval STEM pipeline activities
- Increase awareness of naval engineering career pathways
- Promote research opportunities for faculty

In large part, this emphasizes development of content for K-12 students to promote pathways to engineering degrees, college aged students to broaden their understanding of post-graduation options, and faculty to build awareness of collaboration and funding opportunities. While each episode uses language aimed to be appropriate for general, non-technical audiences, these emphasis areas have driven the overarching vision in how guests are identified for the podcast. Specific mapping of episodes (titles and brief captions) to these target audiences is as follows.

- Target audience: K-12 students and parents
  - Engineering is a Team Sport
    Interested in a sampling of life as a Mason Mechanical Engineering student? Tune in for capstone day interviews with graduating seniors on teams High Rollers, PIT, and Glide Walkers.
  - 2022 Capstone Design
    To learn more about the projects described here and our capstone design program, check out the Department of Mechanical Engineering's Capstone Brochure and Annual Report at: https://mechanical.gmu.edu/connections/senior-design-capstone.
- Target audience: college students
  - Mason ties to the Naval Air Warfare Center Aircraft Division (NAWCAD)
    In this episode hear from Jazzmin Robinson, Mason alum and student leader, on her pathway to a Navy civilian career, along with Theresa Shafer for her tips on how to land the job of your dreams with the Navy.
  - Race a submarine; launch a career
    In this episode, Kariann Vander Pol and Regan Alex describe how their undergraduate experiences competing at the International Submarine Races, a biennial event in which students design, build, and race human-propelled submarines, led them to careers at the Naval Surface Warfare Center, Carderock Division. For more information on programs and places referred to in this episode, check out:
    - *International Submarine Races: https://internationalsubmarineraces.org*
    - *Naval Research Enterprise Internship Program (NREIP): https://navalsteminterns.us/nreip/*
    - *Naval Surface Warfare Center, Carderock Division: https://www.navsea.navy.mil/Home/Warfare-Centers/NSWC-Carderock/*
  - Entering the mechanical engineering workforce

In this episode, I chat with Ann Garner and Philip Wilkerson from Mason's Career Services. Listen in on their tips for students entering the job hunt, as well as for employers looking to recruit mechanical engineers. Links referred to in this episode include:

- *Handshake, https://gmu.joinhandshake.com/login*
- *LinkedIn Learning, https://www.linkedin.com/learning/ , http://lil.gmu.edu*
- *Mason Career Services, "Career Readiness Guide," https://go.gmu.edu/careers-guide*
- *NACE, "What is Career Readiness?" https://www.naceweb.org/career-readiness/competencies/career-readiness-defined/*

- Target audience: faculty
  - Summer Faculty Research Programs – Bridges Between Academia and the DoD
    In this episode, we discuss DoD Summer Faculty Research Programs with Mehdi Amiri from Mason's Department of Mechanical Engineering, who spent a recent summer in the Air Force Research Laboratory program with their Materials and Manufacturing Division, and Chi Yang from Mason's Center for Computational Fluid Dynamics, College of Science, who has worked with the Naval Surface Warfare Center Carderock Division's Center for Innovation in Ship Design over multiple summers.
  - 2021-2022 AY ONR Lecture by Dr. Knox Millsaps
    This episode is a recording of the 2021-2022 Academic Year ONR Lecture at George Mason University by Dr. Knox Millsaps.
- Target audience: general
  - You are not an atom.
    Do you understand what quantum technologies are? Me neither, at least not until I had this conversation with Profs. Pilgyu Kang and Patrick Vora, both members of the leadership team for Mason's Quantum Science and Engineering Center, QSEC. In this episode they give examples of quantum science and engineering applied to materials, sensors, and computing, explain what quantum researchers do, and discuss how to prepare for a career developing quantum technologies.

Metrics

The podcast itself has a small following. Table 1 provides a list of the previously described eight episodes released as of this writing, including episode release date, length, and number of plays. Episodes were promoted via the departmental twitter feed and guests' social media. With a strong base set of episodes, broad advertisement of the podcast is a ripe opportunity for growth of this initiative.

Episode	Release Date	Length (min:sec)	Number of Plays
Engineering is a Team Sport	6/6/21	17:44	36
Summer Faculty Research Programs – Bridges Between Academia and the DoD	7/20/21	14:00	31

Mason ties to the Naval Air Warfare Center Aircraft Division (NAWCAD)	10/13/21	09:27	37
Race a submarine; launch a career	11/15/21	07:01	40
You are not an atom.	1/12/22	40:30	72
2022 Capstone Design	5/8/22	22:08	23
2021-2022 AY ONR Lecture by Dr. Knox Millsaps	7/5/22	30:51	21
Entering the mechanical engineering workforce	8/16/22	20:28	55

Table 1: List of episodes, release dates, episode lengths, and number of plays, for the Mason Mechanical Engineer podcast.

Anchor provides valuable audience data to help understand the demographics of current listeners[6]. For this podcast, we know the listenership is predominantly domestic (68%), though the podcast also has an international impact with the next four largest geographic segments of listenership being in Germany (14%), Netherlands (3%), India (3%), and Canada (2%). Within the United States, 55% of listeners are in Virginia and 12% are in the District of Columbia. For access platforms, 31% listen via Apple Podcasts, 26% via web browser, 20% through Anchor, 8% through Spotify, 7% through Google Podcasts, and 7% other. Listeners historically tune in from Windows machines 25% of the time, 23% from iPhones, 20% from the Web, 15% from Android devices, 15% from Macs, and 2% other. For those who listen via Spotify, we have further detail, namely that 72% are male, 24% female, and 4% do not have gender specified. Spotify also provides age demographics; 24% of Mason Mechanical Engineers listeners are 18-22, 28% are 23-27, 28% are 28-34, 16% are 35-44, and 4% are 45-59. These demographics are illustrated in Figures 1-5.

Reflection on Goals

As stated in the opening to this paper, the objectives of our ONR-supported STEM outreach activities are to increase participation of Northern Virginia K-12 students in naval STEM pipeline activities, increase awareness of naval engineering career pathways, and promote research opportunities for faculty. While we do not have direct measures of attainment for these goals, we infer findings and opportunities based upon the metrics presented in the prior section. For example, we know we are engaging college-aged listeners based on the 24% listenership between the ages of 18-22. Furthermore, we know we are reaching a higher percentage of female listeners (24%) than the number of women who comprise the mechanical engineering (9.4%) workforce[7] (gender data for marine engineers and naval architects is not captured in the 2021 Bureau of Labor Statistics data). Our aim of serving Virginians is being met through our 55% listenership in Virginia, though notably our listenership in nearby Maryland is only 1%. Increasing the listener base in Maryland would potentially serve the goal of building awareness of the naval STEM pipeline recognizing many Navy research facilities near Mason are in Maryland.

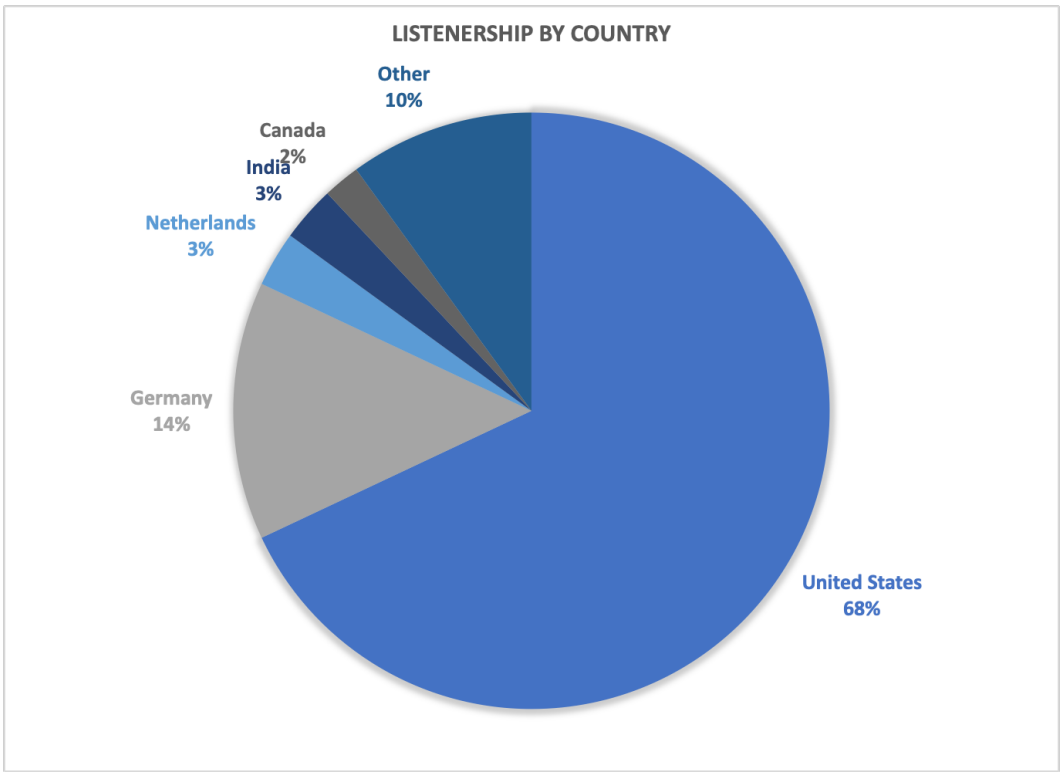

Figure 1: The Mason Mechanical Engineer listenership by country, chart reproduced from Anchor data[6].

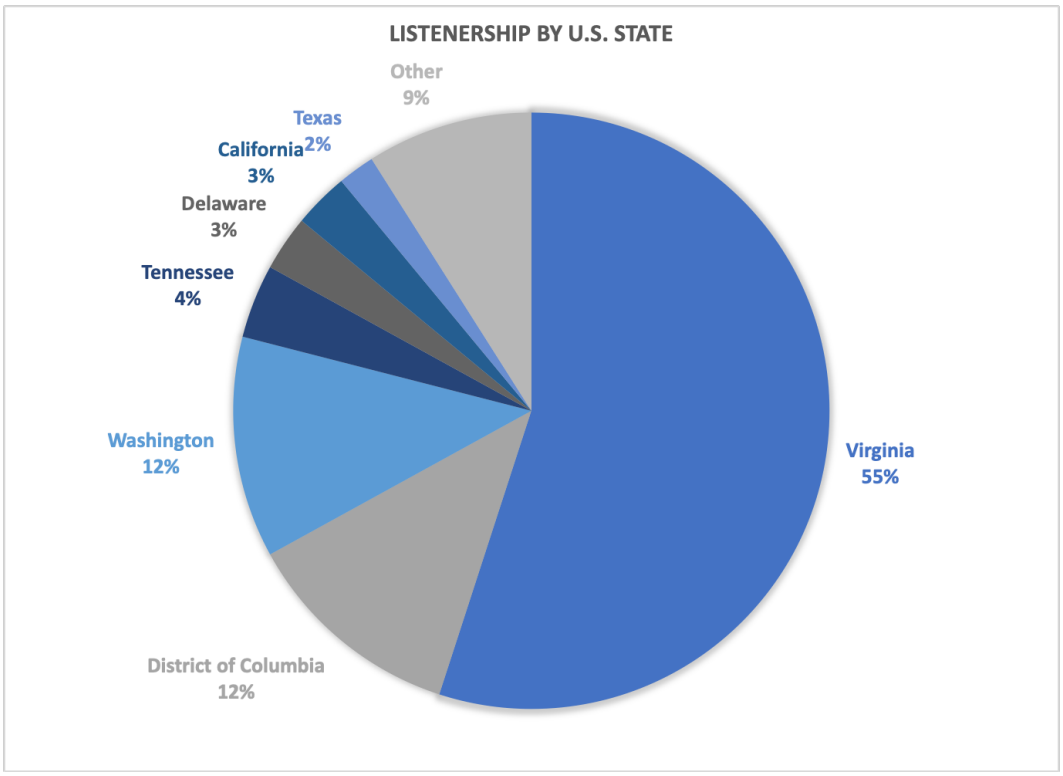

Figure 2: The Mason Mechanical Engineer listenership by state, chart reproduced from Anchor data[6].

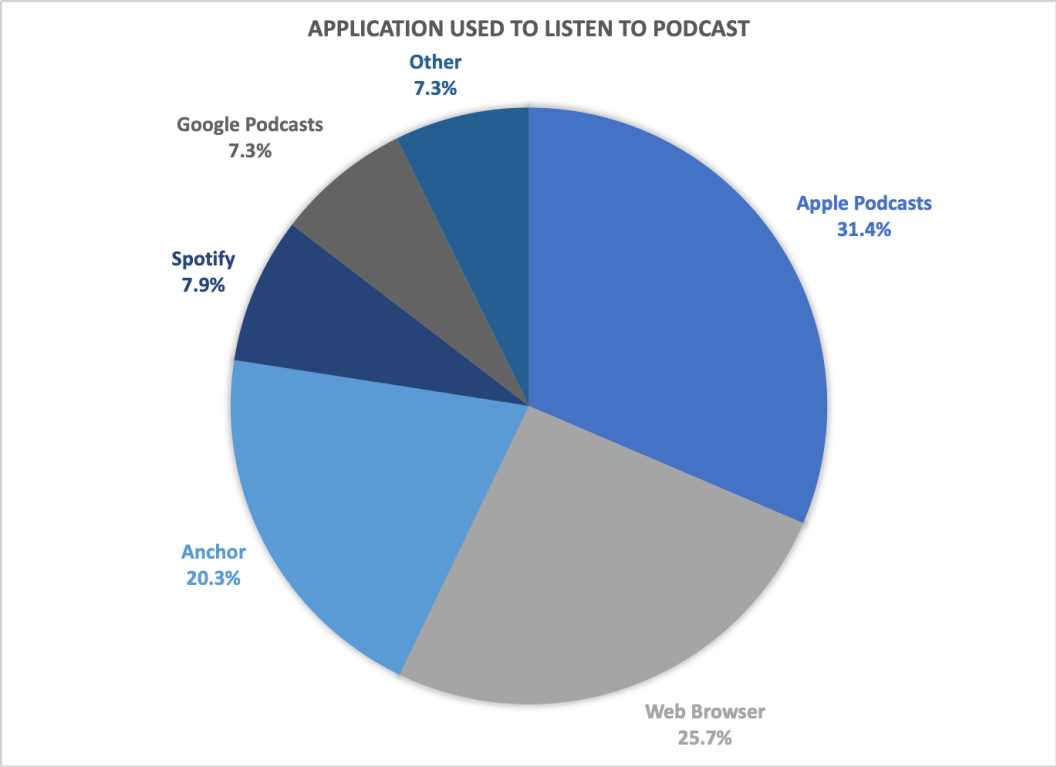

Figure 3: Application used to listen to the Mason Mechanical Engineer podcast, chart reproduced from Anchor data[6].

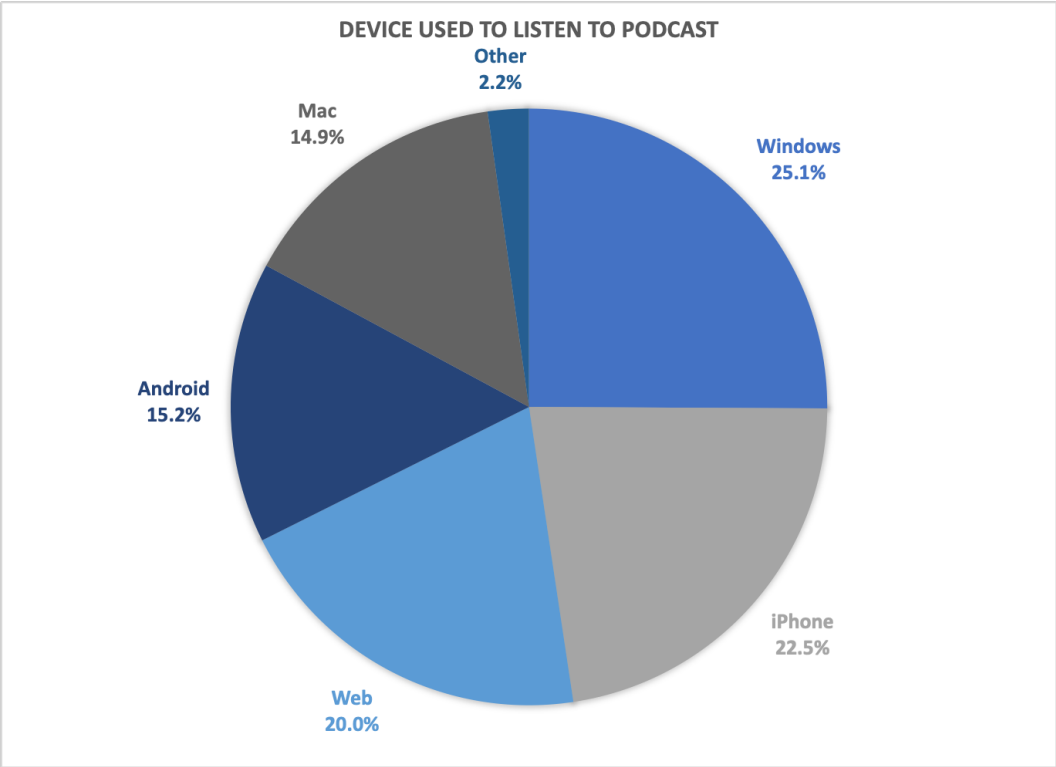

Figure 4: Device used to listen to the Mason Mechanical Engineer podcast, chart reproduced from Anchor data[6].

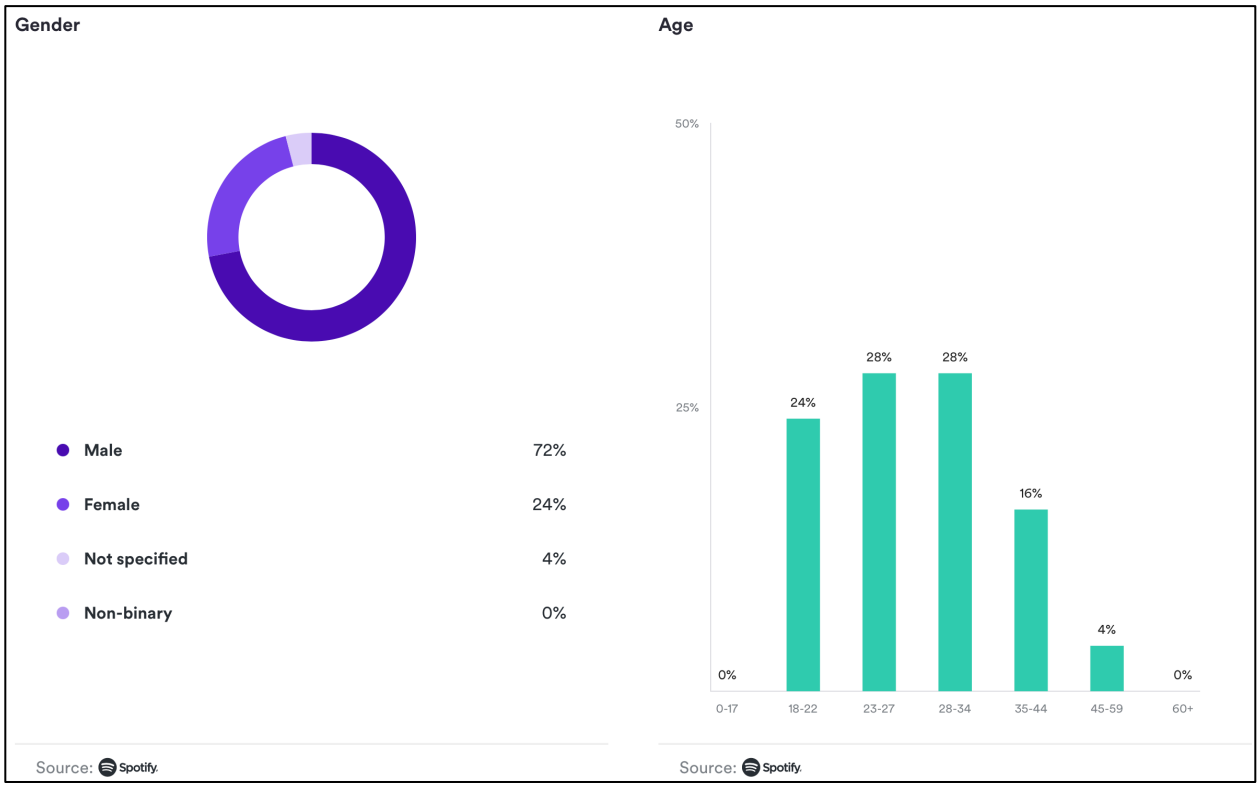

Figure 5: Anchor screenshot of gender and age demographics of Mason Mechanical Engineer podcast listeners using Spotify[6].

Lessons Learned and Future Plans

As face-to-face activities resumed, we continue to leverage the podcast as part of our department's broader outreach vision, including utilization of an in-person event recording to form the basis of a podcast episode (e.g. the lecture by Dr. Millsaps). Going forward, our aims include increasing listenership through broader marketing of the existence of the podcast, improving audio quality through acquisition of dedicated equipment intended for podcasting, rather than that which is used for online instruction, and building toward a consistent podcast length to help drive engagement from a repeat audience.

Lastly, it would be of value, moving forward, to develop direct assessment measures to identify if the objectives of this STEM outreach program are being met. Such measures could include prospective and current student, alumni, parent, Mason STEM-outreach program participant, and faculty surveys to identify if the podcast played a role in naval STEM outreach program participation, career pathway decisions, or influenced the pursuit of internship or funding opportunities.

Acknowledgements

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