FlightSim Community Survey 2023

Final Report

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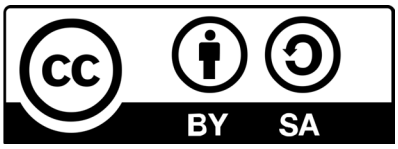


Preamble

We are happy to share the results from the sixth consecutive FlightSim Community Survey where 23,736 respondents contributed and answered 82 questions which Navigraph and 58 survey partners had prepared. The number of respondents, partners, and questions make this survey the largest and most comprehensive of its kind.

This year, in our continuous effort to iterate and improve our work methods, we went well outside of our comfort zone. In the very same year, we decided to switch survey platforms; analyze open-ended questions with Artificial Intelligence; and clean and transfer the collected data to a Business Intelligence platform replacing spreadsheets. Pretty ambitious! What could possibly go wrong?

I am happy to report that we seem to have succeeded in everything we set out to do and we are in a good shape for realizing this survey also in the coming years. In the light of these changes we would like to thank all the respondents for your patience and understanding in navigating a new user interface. We also hope that respondents will find the AI-generated insights presented in this survey worth the effort of answering some questions seemingly peripheral to flight simulation - like your taste in music for instance.

Switching survey platforms required us to do a small-scale test to make sure we would not disappoint thousands of respondents graciously providing their free time to answer the survey. We used this opportunity to do a pre-survey asking survey partners to submit material for the final survey. This 1-to-n structured approach eliminated the 1-on-1 emailing which had consumed a lot of time previous years. Asking partners about survey ideas also boosted creativity. The team could also acquaint themselves with the new design interface before designing the 82 questions of this year's survey. (The remaining data in the Partner Survey will be analyzed and presented in a separate report early 2024.)

Switching survey platforms turned out to be a great opportunity to revise the questions and structure. The survey storyline was made more like an interview, more user-centered, and less about the simulators and products. This enabled us to put questions suitable for skip logic and segmentation earlier in the survey making the survey shorter and more relevant to a bigger audience. Because of this method, no respondent was subjected to all 82 questions, but instead guided to relevant questions by previous responses.

The user-centered interview style in this year’s survey resulted in more open-ended questions compared to last year. We wanted to be able to perform thematic and sentiment analysis with AI but admit that it was a bit of a gamble because we didn’t know how AI language models would handle answers written in the brief shorthand style which is typical for survey responses. Responses like “idk” meaning “I don’t know” or “all of them” became a little tricky.

This leads me to data validation and data cleaning in the BI system. The increased number of open-ended questions also made it easier to find and remove bogus respondents. We believe that while filtering data leads to fewer respondents, the quality of the information in the data increases. The collaborative and visual nature of the BI system also helped in filtering poor data.

While we are happy with the improvements we have made to this year’s survey we must extend our gratitude to each and one of you respondents contributing with your time and insightful feedback. We must also recognize the contribution among survey partners - developers, companies, organizations, and media outlets in the flightsim community. Together we design the questions and help distribute the survey to our users, customers, members, and readers.

Navigraph's role is to organize, design, and compile the survey and make the results freely available for the common good of the flightsim community to guide future projects and ultimately to attract new pilots.

At Navigraph Jennifer Bunn, Malin Söderlund, Jenny Tjernell, Andreas Goodholm, Markus Hamburger, Stephen O'Connell, and I have communicated, analyzed, edited, and coordinated the efforts in producing this survey. It's been hard work, but also fun and interesting. We hope you enjoy reading it!

Stockholm, December 2023

Magnus Axholt
CEO & Co-Founder

Table of Contents

1. Introduction

1.1. Partners

The FlightSim Community Survey 2023 is a collaborative effort conducted by the developers, organizations, and companies alphabetically presented in the list of partners below.

- Aerosoft
- Air France Virtuel
- Avitab
- BelGeode (Boomflowah production)
- Bluebird Sim
- Carenado
- Cruiselevel.de
- Delta Virtual Airlines
- Digital Flight Dynamics
- Elevatex
- Fast Cow Productions
- Flight1 / Flight One Software
- FlightFX
- FlightSimulator.blog
- FlyByWire
- Flying Media Group
- FSA/FSExpo
- FSElite
- FSMagazin
- FSNews
- FSNews24
- FSReborn

- FSS - Flight Sim Studio
- GearDown Simulations
- GeoFS
- Haversine
- Headwind Simulations
- Heavy Division
- HeliSimmer.com
- Horizon Simulations
- Hype Performance Group
- Infinite Flight
- IVAO
- Laminar Research / X-Plane
- LivToAir
- Lockheed Martin / Prepar3D
- LVFR
- Metaflight
- MSFSAddons.com
- Navigraph*
- Orbx
- PC Pilot
- PilotEdge
- PMDG
- PMS50
- Qbit Simulations
- RealTraffic / Inside Systems Pty Ltd
- Salty Simulations
- SimFlight / SimMarket
- Simvol
- SimWorks Studios
- Synaptic Simulations
- Tds Sim
- The Flight Lounge
- Thresholdx.net
- TorqueSim Aircraft Development
- Total Aviation
- V Pilot Designs
- VATSIM

*) Navigraph was responsible for coordinating, designing, compiling, and funding the survey, as well as authoring this document.

1.2. Purpose and Target Audience

The primary purpose of the survey is to provide the participating partners with comprehensive insights into the flight simulation community, enabling them to:

- recruit new pilots to the flight simulation community
- develop products and services in response to pilots' needs and requests

The secondary purpose of the survey is to provide all members of the flight simulation community with information, enabling them to:

- find resources to develop their flight simulation interest
- maintain and develop the community

1.3. Data Protection

The data was collected from the respondents anonymously without storing any personally identifiable information. The results are presented in aggregated form, never individually. The data was collected in the legitimate interest pursued by Navigraph and the partners. To the best of our judgment, the survey was conducted in a fashion compliant with the General Data Protection Regulation (EU) 2016/679. For any questions regarding user privacy, please contact contact@navigraph.com.

1.4. Previous Work

VATSIM conducted a survey in 2006, with a total of 6,691 respondents.

AVSIM has previously published a demographic survey for the flight simulation community. The most recent one was made in 2013[1]. It had approximately 2,800 respondents.

In 2016 there was a DCS Playerbase Survey[2] with 851 respondents[3]. It was repeated in 2022[4] and had 1,488 respondents[5].

Laminar Research has collected usage data from its X-Plane simulator and published two reports[6] in November 2017, and June 2018.

Navigraph has previously conducted customer surveys. In 2017[7] it had 3,187 respondents. In 2016 2,200 participated. While these surveys had significant portions aimed at product feedback specific for Navigraph, they also had demographic questions included from the AVSIM survey.

[1] https://www.avsim.com/forums/topic/430855-results-of-the-2013-avsim-community-demographics-survey/
[2] https://www.reddit.com/r/hoggit/comments/4m4ooo/june_2016_dcs_playerbase_survey_inprogress/
[3] https://docs.google.com/forms/d/1bNSk2Z8qt0utoiKrGHpuxdG_xnvoG6dTUaVXiqKxi5c/viewanalytics
[4] https://www.reddit.com/r/hoggit/comments/wmkon8/dcs_community_survey/
[5] https://docs.google.com/forms/d/1t9baBZGenMZXUfzdg1iJdTeu9hEkgAQdMfSYcpR4FBs/viewanalytics
[6] https://developer.x-plane.com/category/x-plane-usage-data/
[7] http://blog.navigraph.com/post/167492052421/survey-results-prepar3d-x-plane-up-fsx-down

With the collaboration of partners, Navigraph conducted flight community surveys in 2018[8] (15,000 respondents), 2019[9] (17,800 respondents), 2020[10] (23,500 respondents), 2021[11] (24,200 respondents), 2022[12] (25,400 respondents).

It is our impression that there have been additional small surveys completed in the past. Either they have been published by various developers with the intent of obtaining specific product feedback, or they have been published by interest organizations with the intent of obtaining feedback on the particular operations of that organization.

The FlightSim Community Surveys from 2018 to 2023 differ in that each iteration possesses:

- a larger sample size, i.e. many more respondents compared to any previous flight simulation community survey to date
- a sample which represents multiple user groups, i.e. users from various developers and members from various organizations

[8] https://navigraph.com/blog/flightsim-community-survey-2018-results
[9] https://blog.navigraph.com/post/190623949491/flightsim-community-survey-2019-results
[10] https://blog.navigraph.com/post/640055551804489728/flightsim-community-2020-survey-results
[11] https://navigraph.com/blog/survey2021
[12] https://navigraph.com/blog/survey2022

2. Method

Navigraph initiated the survey collaboration by issuing an official invite through social media channels and the Navigraph newsletter, inviting partners to participate. Partners who contributed to the survey in earlier years were contacted directly via email. In order to achieve a representative sample of the community, partners were purposefully selected from diverse segments of the flightsim community.

Navigraph posted a survey filled out by the partners in which partners were asked to submit areas of particular interest to them. Navigraph edited, consolidated, and designed questions based on the partners' areas of interest.

All partners were asked to publish an individual survey link at a specific date and time. The partners were free to choose how to distribute the link, but many chose to publish on social media, forums, websites, and newsletters. The individual links permitted tracking of how successful each partner was at gathering respondents to the survey.

The respondents were not compensated for their contribution. The incentive for the respondents to contribute to the survey is the possibility to guide development in the flightsim community. The incentive for the partners to contribute to the survey is the possibility to direct the survey into various areas of interest and reach a wider audience compared to publishing an individual survey themselves.

The information presented in this survey report is only based on aggregated data. No other analysis as to statistical significance, power, or confidence interval has been done.

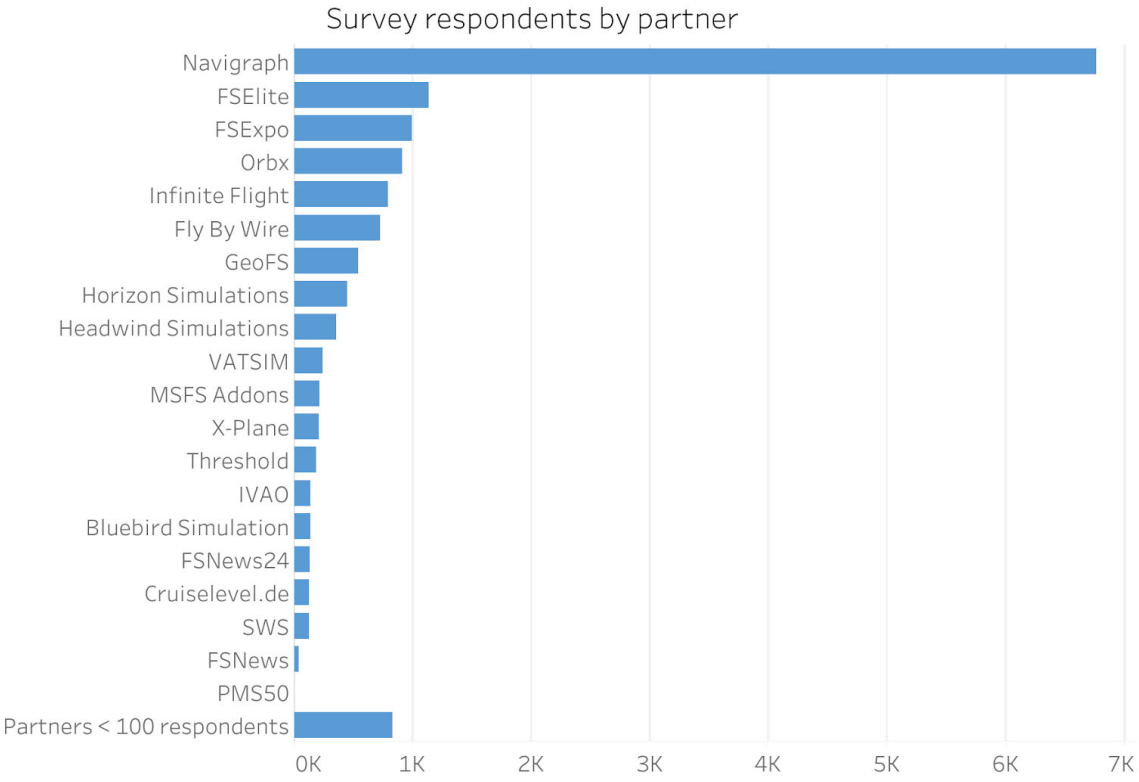
3. Analysis

3.1. Respondents

The survey garnered responses from 23,736 participants with 66% (63%) completing the 82 (67) survey questions. (Values from the previous year are indicated within parentheses.)

The diagram below illustrates the engagement of respondents who clicked on a link published by a survey partner during the survey's publication period from November 17 to 27. Notably, Navigraph, depicted at the top of the diagram, led in contributions, followed by FSElite, FSExpo, and Orbx (In the previous year, the highest contributors were Navigraph, Infinite Flight, Honeycomb, Orbx, and FSElite).

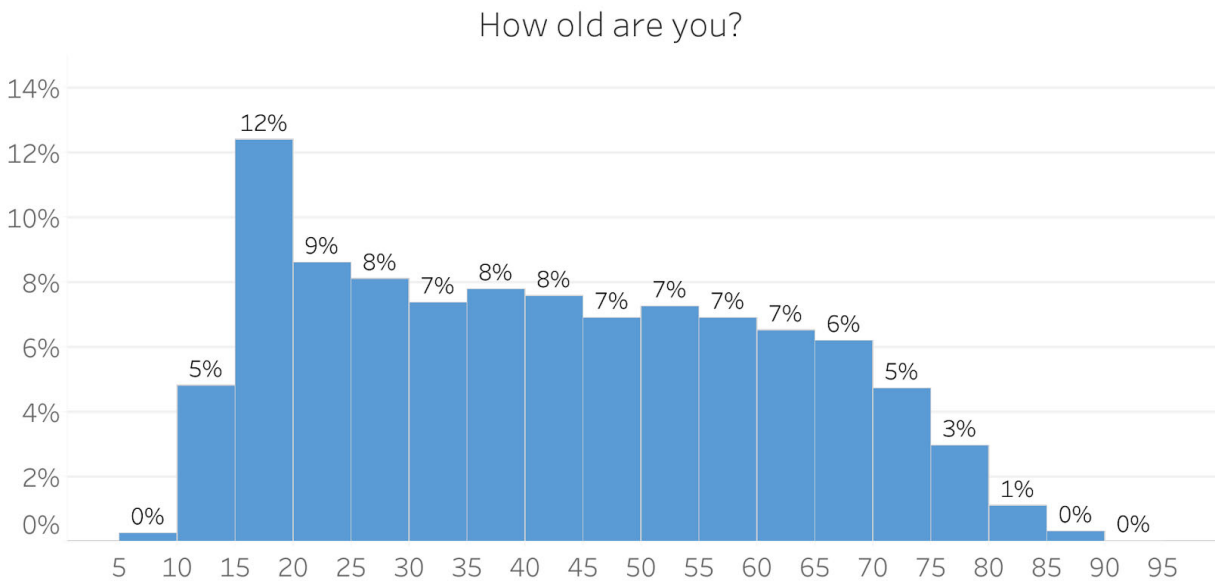
Partners contributing fewer than 100 respondents are consolidated into the lower bar.



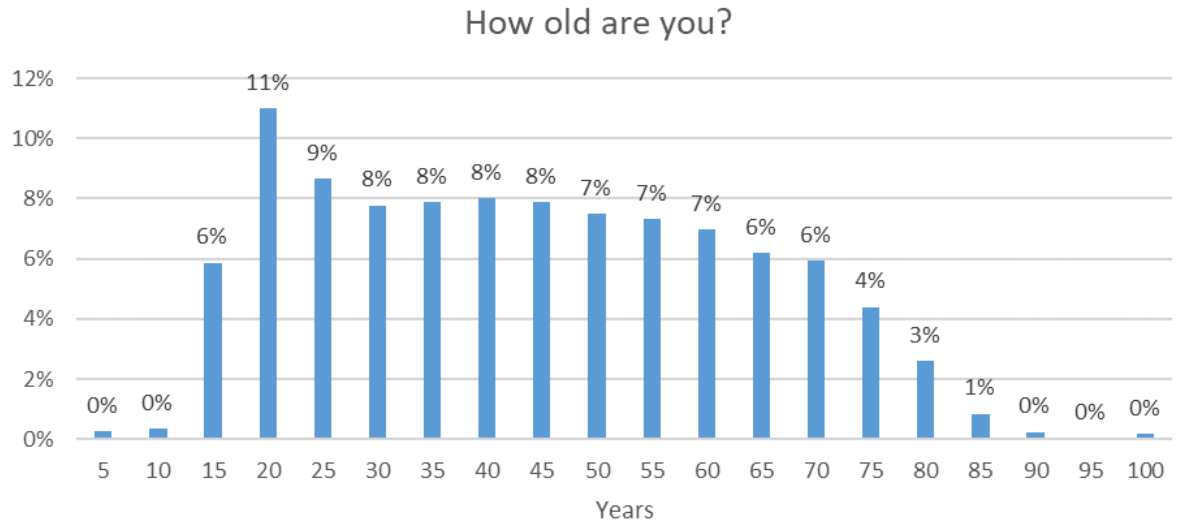
3.2. Demographics

3.2.1. Age

The consistent distribution indicates that flight simulation remains appealing to individuals of diverse age groups. While the primary user base spans ages 15 to 85, there is a noticeable concentration around 20, accompanied by a noteworthy extension towards 85. The age distribution in 2023 closely resembles that of the past five surveys, maintaining a similar pattern in both the overall age range and the distinct peak around 20.

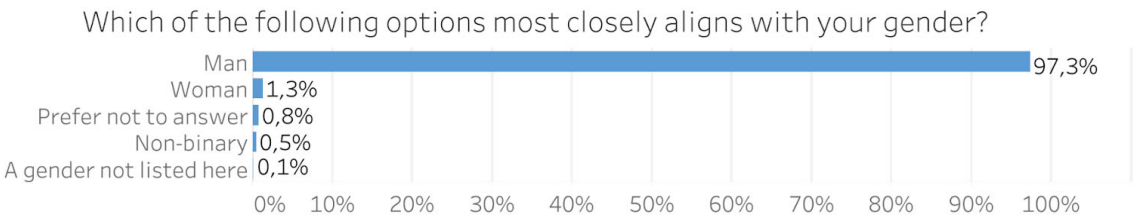


Last year's result:



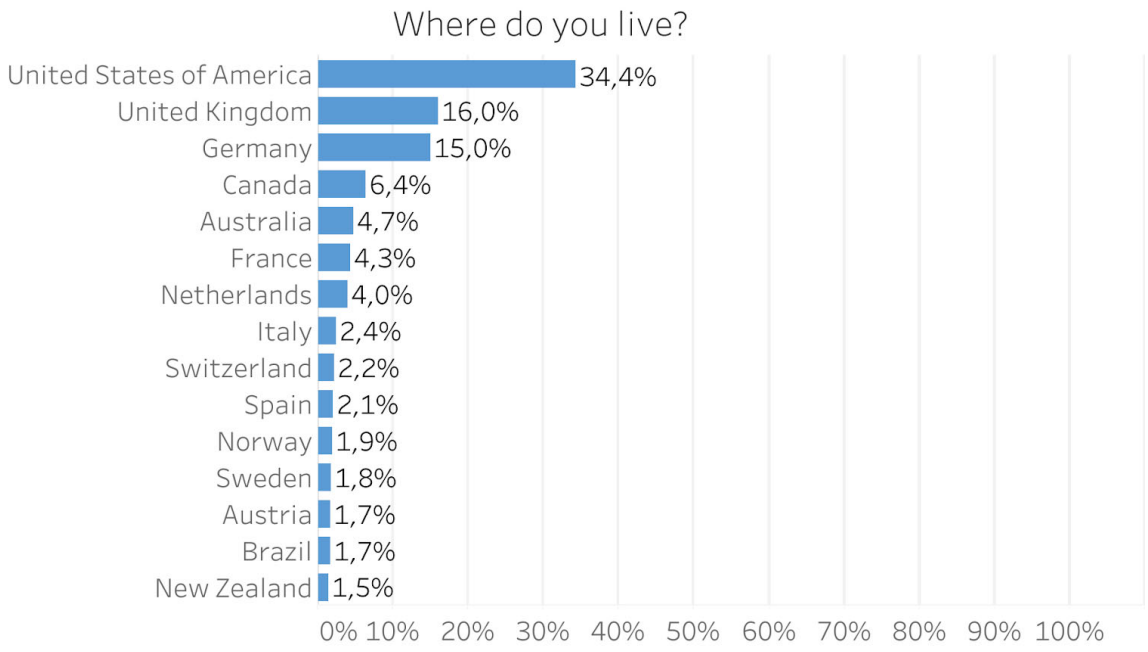
3.2.2. Gender

The survey indicates that 97.3% of the respondents are male. This question was last asked in 2021, in which 96.9% of the respondents were male.

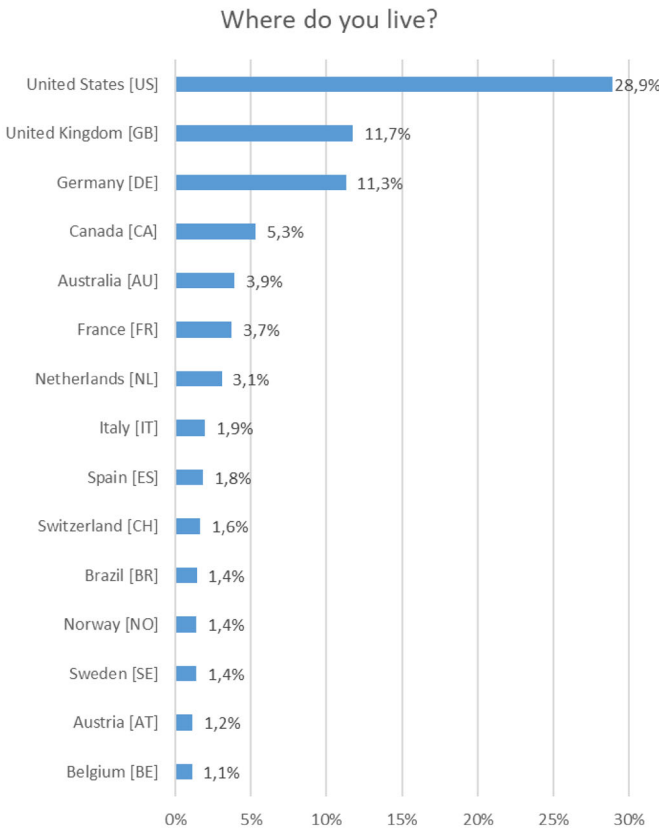


3.2.3. Location

This year, the top two countries remain the same as the three previous years. We had an increase of respondents from Germany this year, rising from 11.3% to 15.0%. Additionally, New Zealand entered the top 15 this year, displacing Belgium from the list.

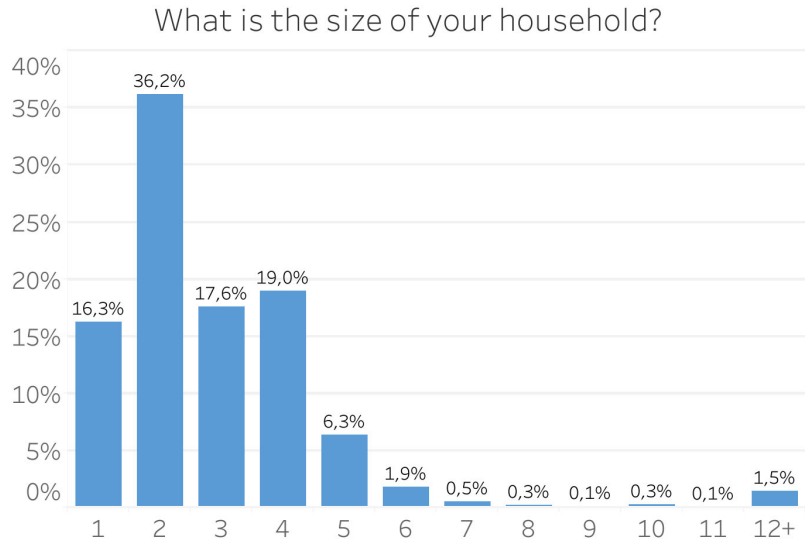


Last year's result:



3.2.4. Household Size

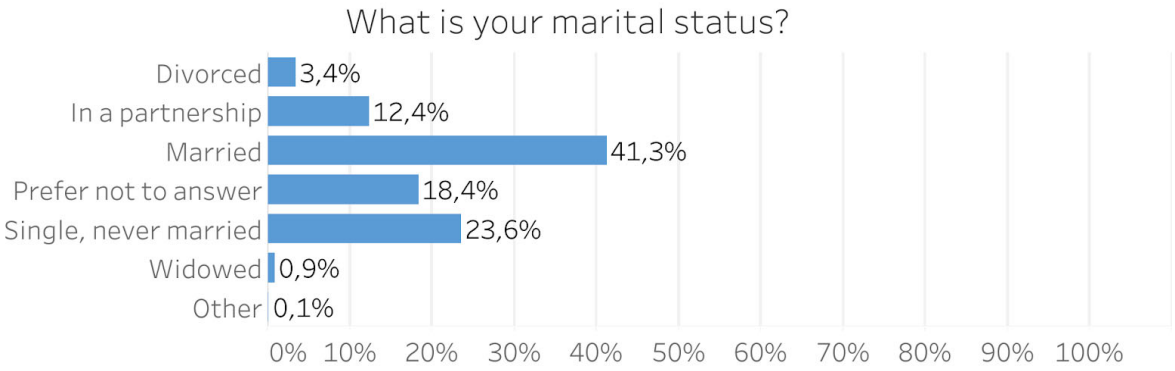
The most prevalent household size among respondents is 1-4, with a noteworthy peak of 2 individuals at 36.2%.



3.2.5. Marital Status

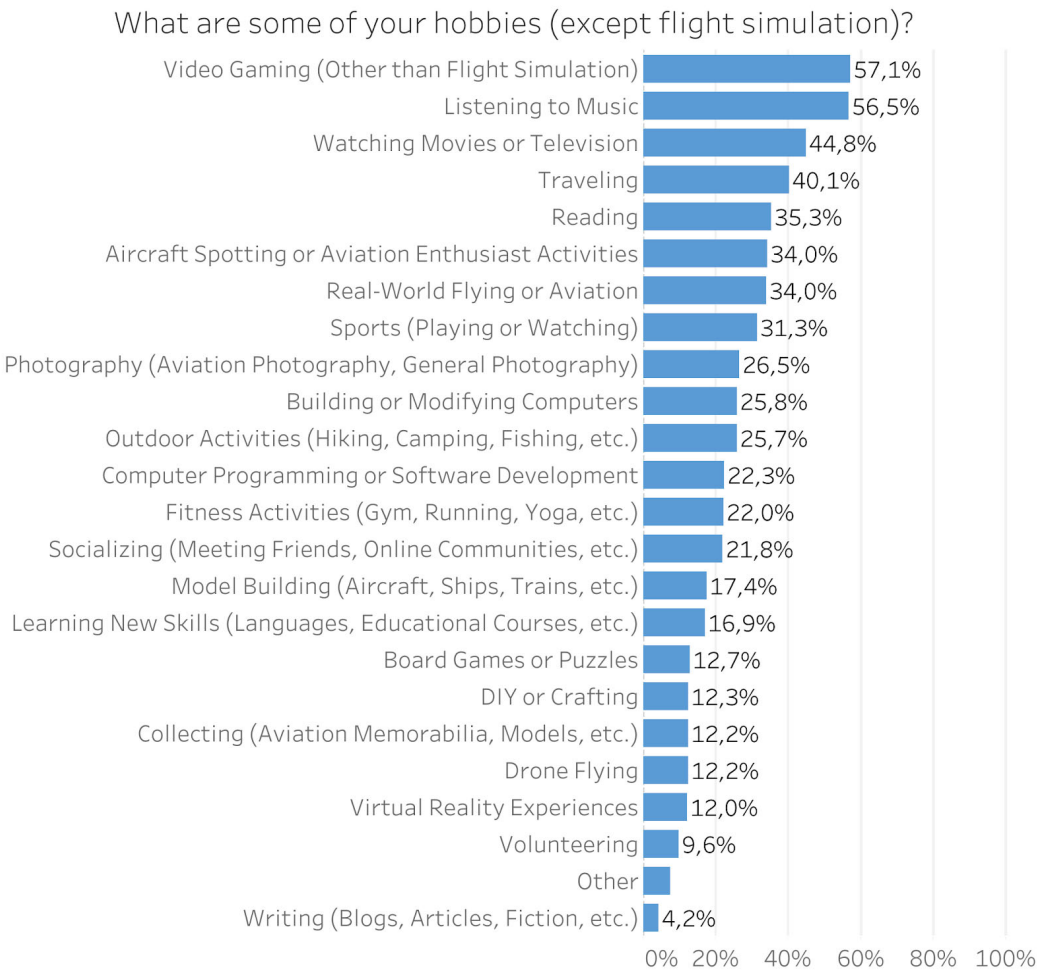
Among the respondents who answered this question, 41.3% are married, while 12.4% are in a partnership. At 23.6%, almost one in four are single or have never been married.

This question was posed to respondents with an age greater than 17 years.



3.2.6. Hobbies

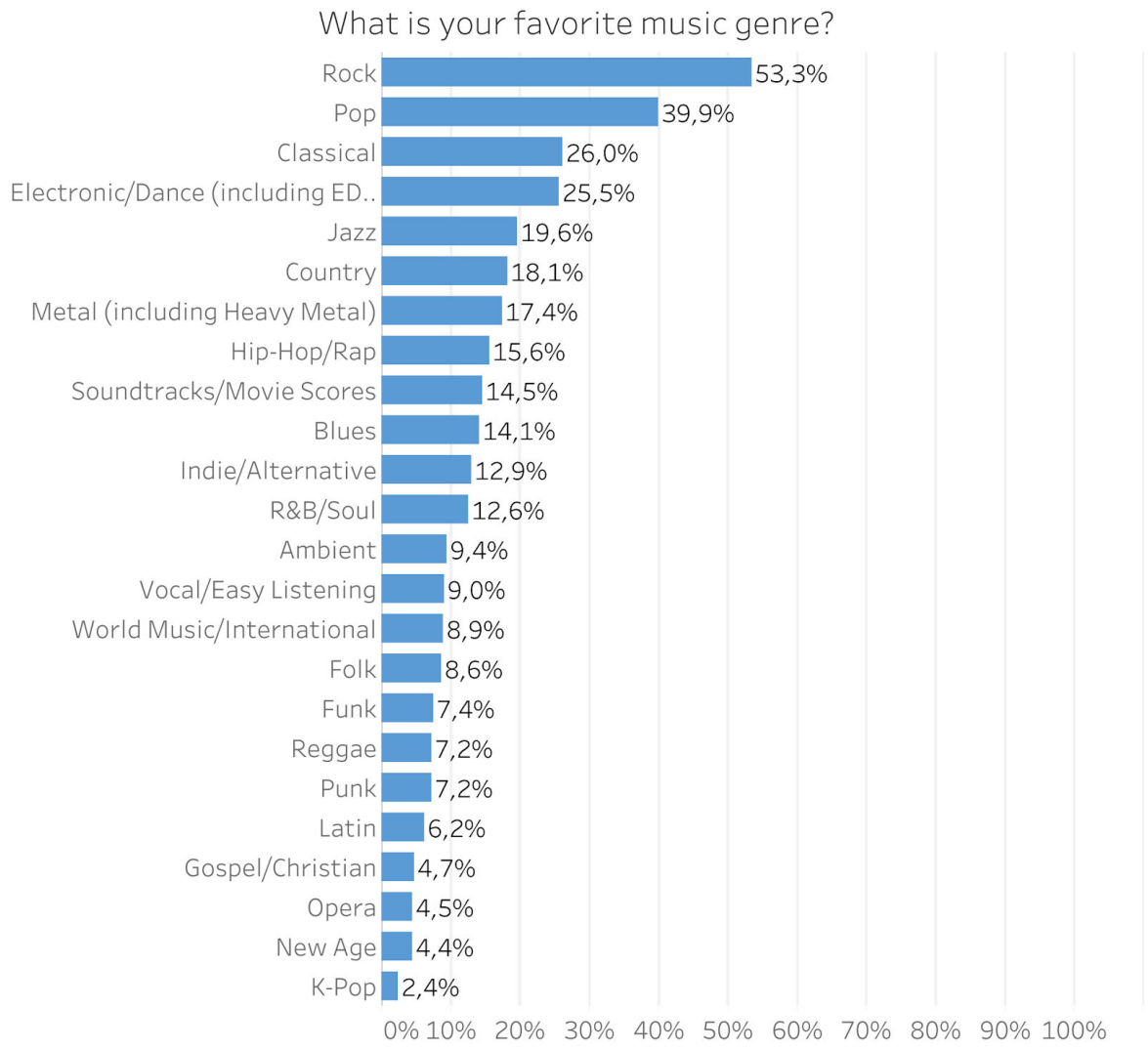
Through posing this question, we aimed to uncover shared interests beyond flight simulation within the flight simming community. Our findings reveal that a majority of respondents engage in playing other video games and listen to music as their hobbies.


What are some of your hobbies (except flight simulation)?
Video Gaming (Other than Flight Simulation) 57,1%
Listening to Music 56,5%
Watching Movies or Television 44,8%
Traveling 40,1%
Reading 35,3%
Aircraft Spotting or Aviation Enthusiast Activities 34,0%
Real-World Flying or Aviation 34,0%
Sports (Playing or Watching) 31,3%
Photography (Aviation Photography, General Photography) 26,5%
Building or Modifying Computers 25,8%
Outdoor Activities (Hiking, Camping, Fishing, etc.) 25,7%
Computer Programming or Software Development 22,3%
Fitness Activities (Gym, Running, Yoga, etc.) 22,0%
Socializing (Meeting Friends, Online Communities, etc.) 21,8%
Model Building (Aircraft, Ships, Trains, etc.) 17,4%
Learning New Skills (Languages, Educational Courses, etc.) 16,9%
Board Games or Puzzles 12,7%
DIY or Crafting 12,3%
Collecting (Aviation Memorabilia, Models, etc.) 12,2%
Drone Flying 12,2%
Virtual Reality Experiences 12,0%
Volunteering 9,6%
Other
Writing (Blogs, Articles, Fiction, etc.) 4,2%
0% 20% 40% 60% 80% 100%

3.2.7. Music Preference

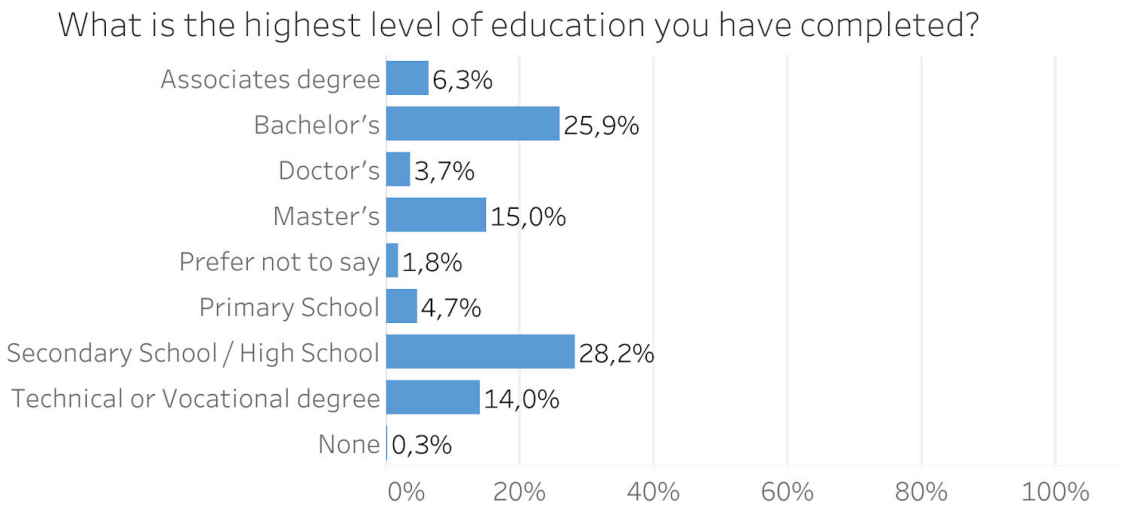
The question about respondents' music preference was introduced in this year's survey. This question is seemingly peripheral to flight simulation but was motivated by our ambition to build AI-generated personas reflecting the flight simulation community.

Over 50% of respondents express a preference for Rock music, with Pop and Classical genres also garnering significant popularity.

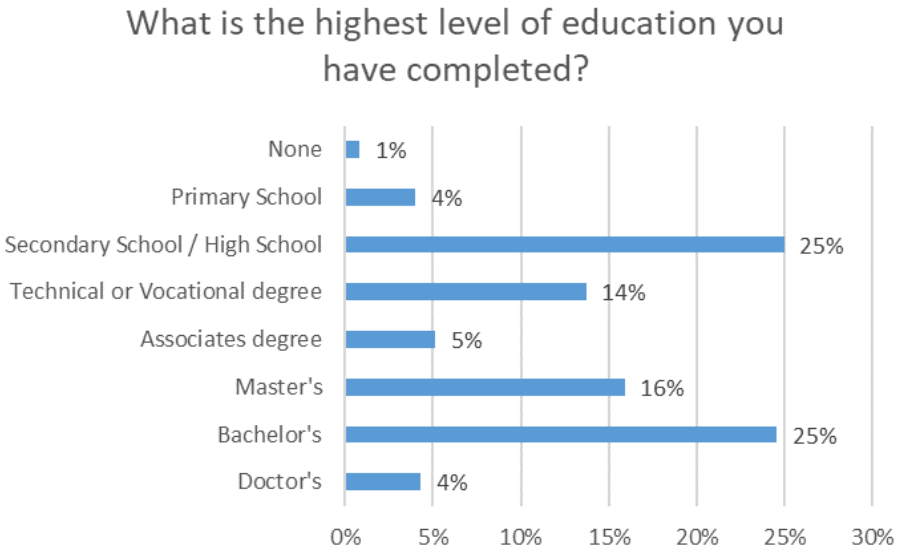


3.2.8. Education

Most respondents either have a Secondary School/High School or a Bachelor's degree. The results are comparable to the previous four years.



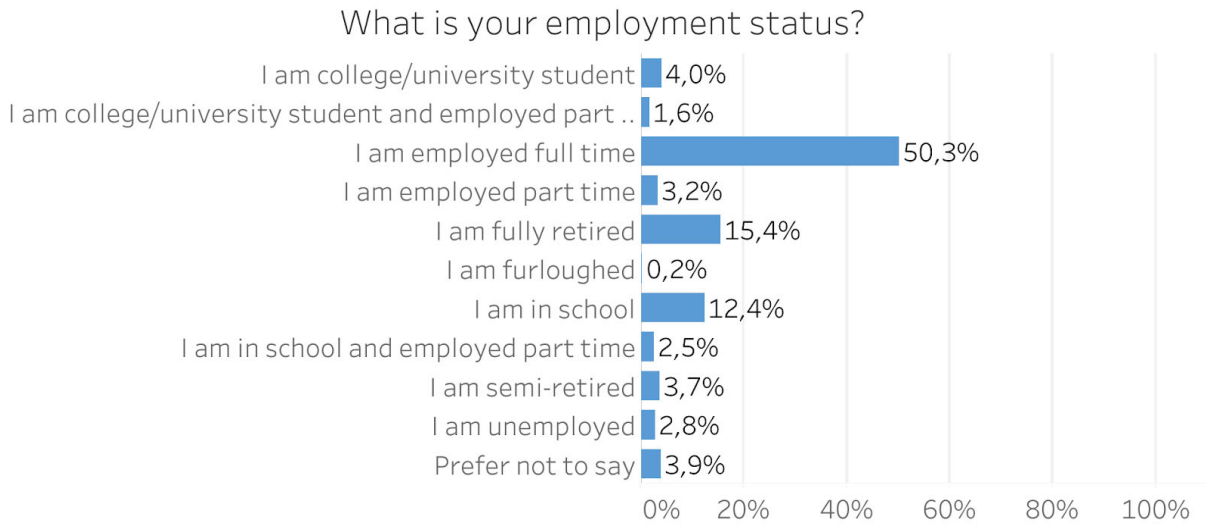
Last year's result:



3.2.9. Work

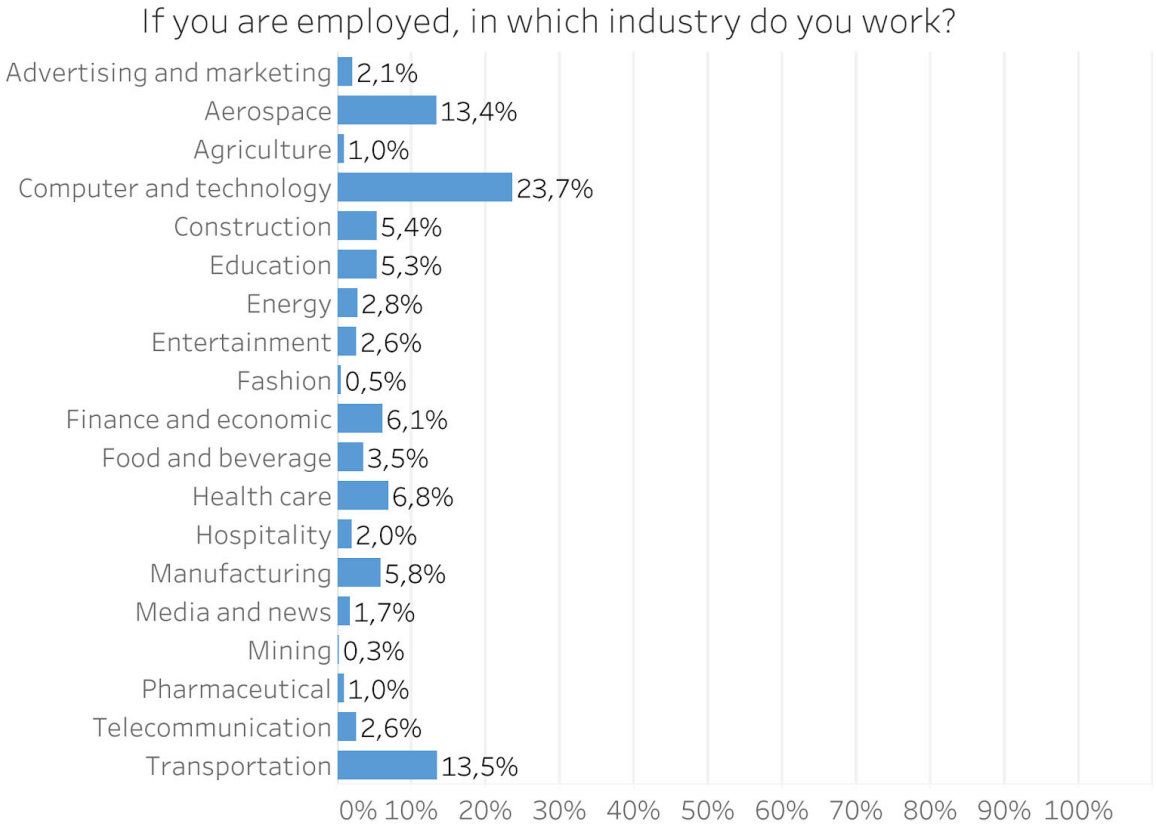
3.2.9.1. Employment Status

The following question was asked in the 2021 survey. Similar to the 2021 results, we note that approximately half of the respondents are employed on a full-time basis.

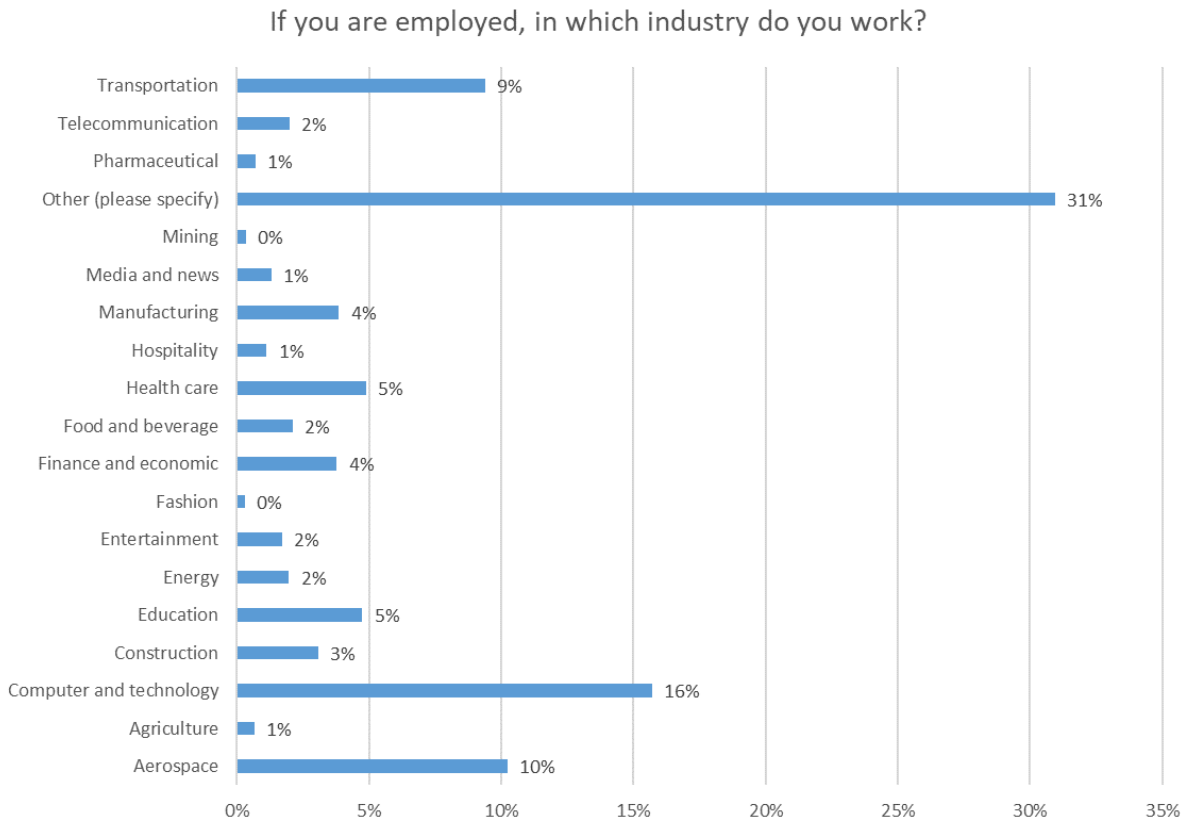


3.2.9.2. Industry

The question was not mandatory and was only presented to respondents who, in the previous question, stated that they were employed. Aerospace, Computer, and technology, as well as Transportation, are common industries among the respondents.

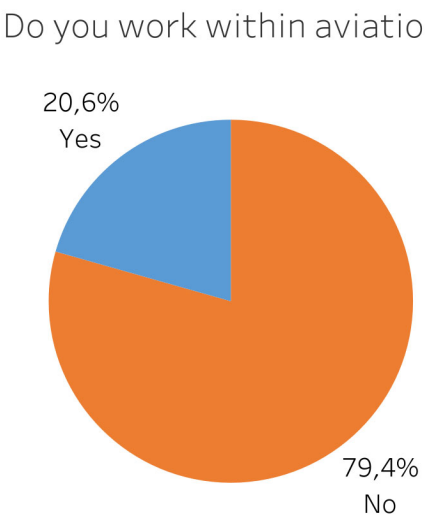


Last Year's Results:



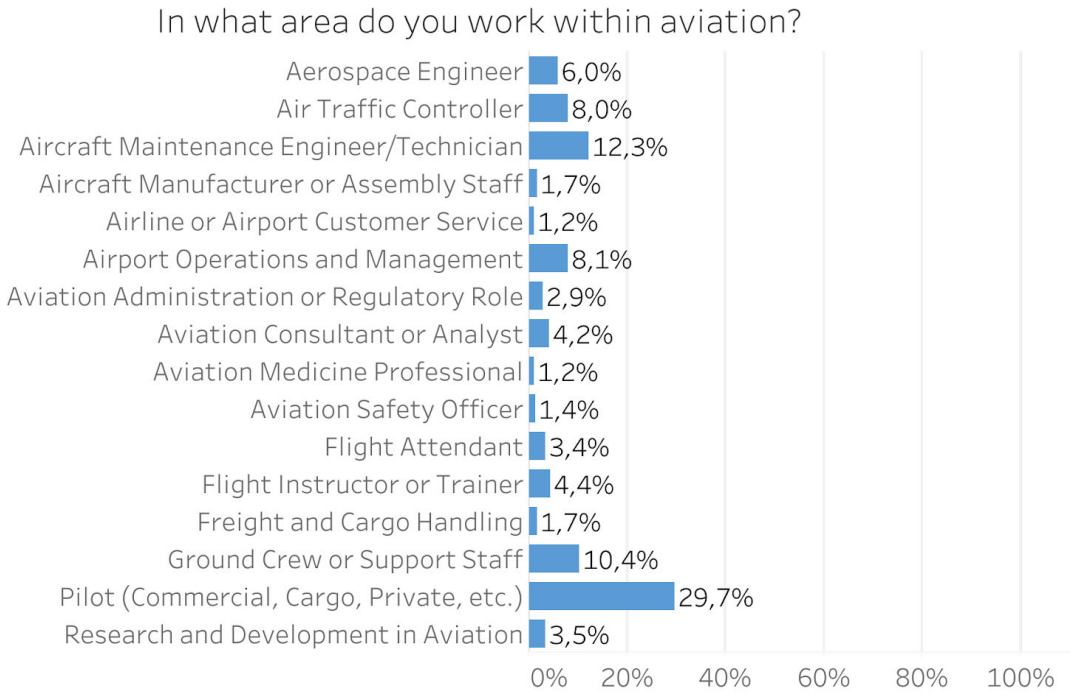
3.2.9.3. Working Within Aviation

We inquired with our respondents about their involvement in the aviation sector. Notably, one-fifth of them currently work within the aviation industry. In comparison, when a similar question was posed in 2021, 83% indicated they were employed within the aviation industry.



3.2.9.4. Aviation Areas

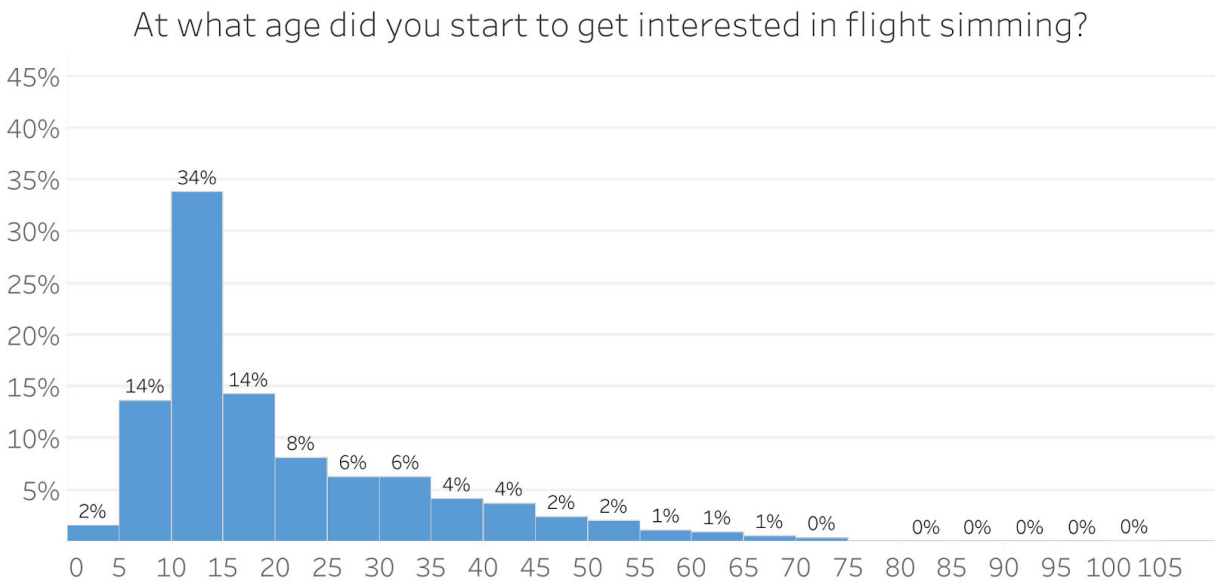
The following question was only posed to those who stated that they work within the aviation industry in the previous question. A predominant 29.7% identified themselves as Pilots, emphasizing their significant representation within the surveyed cohort. Following closely, Aircraft Maintenance Engineer/Technician positions constituted 12.3%, underscoring the essential role of technical expertise in the industry. Ground Crew or Support Staff comprised 10.4%, highlighting the diverse roles encompassed in aviation operations.



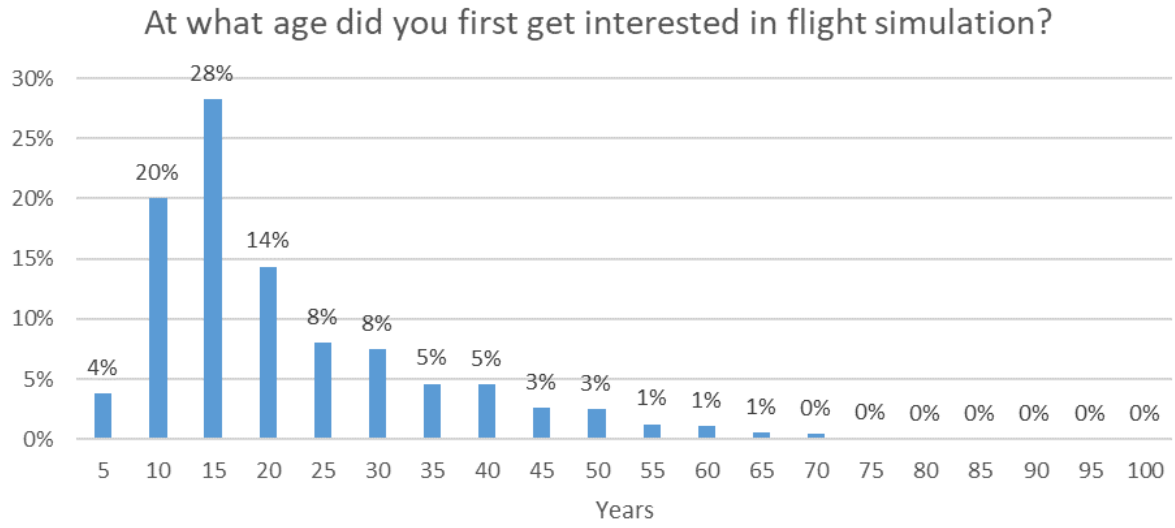
3.3. Background

3.3.1. Simulation Introduction Age

There has been a slight shift in the simulation introduction age compared to last year. In the preceding survey, 20% of respondents were introduced to flight simming between the ages of 5-10, while 28% began their journey between the ages of 10-15 years. This year, a higher proportion of respondents initiated flight simming between 10-15 years, and a smaller percentage commenced between 5-10 years. The distribution across the remaining age brackets remains comparable between 2022 and 2023.

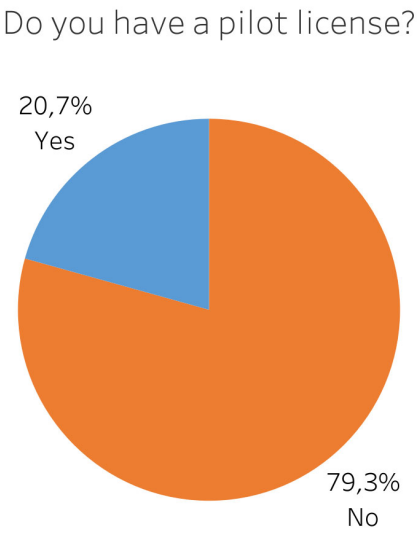


Last year's result:



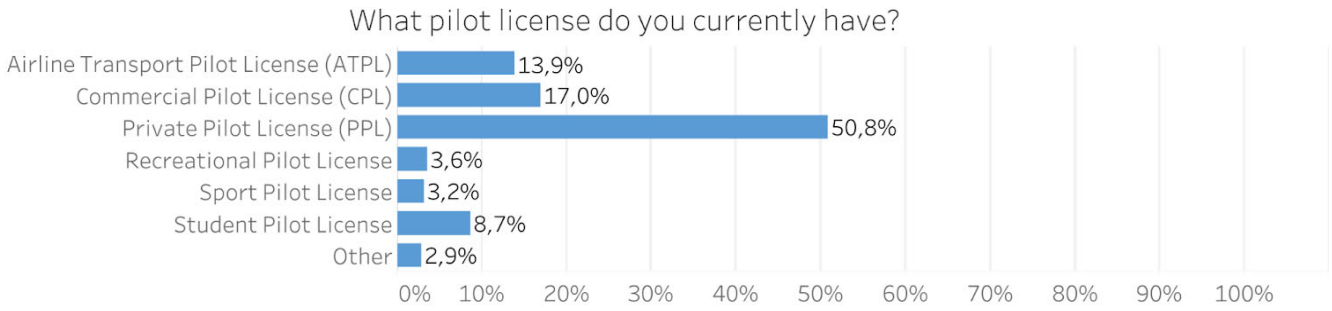
3.3.2. Pilot License

This year we opted for a slight modification in phrasing the question regarding pilot licenses. Unlike the previous year, where we inquired about license type and ratings in a single question that also included “None” as an alternative, this year, we began by asking respondents whether they hold a license or not.

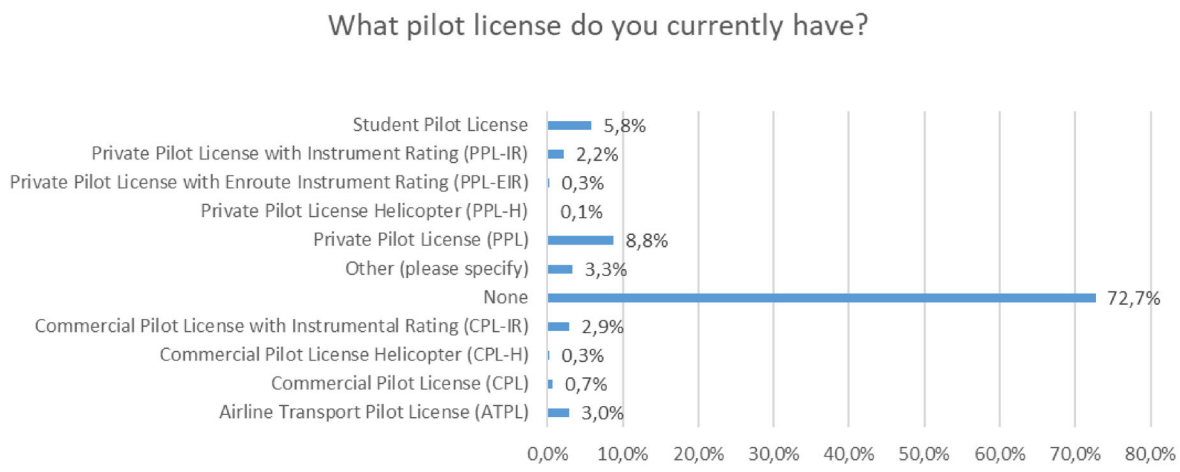


3.3.2.1. License Type

Based on the respondents who stated that they indeed have a pilot license we can establish that 50% respondents hold a Private Pilot License (PPL), emphasizing the prevalence of recreational flying within this group. A substantial 17.0% possess a Commercial Pilot License (CPL), indicative of a noteworthy representation of those engaged in professional aviation pursuits. Furthermore, 13.9% of respondents boast an Airline Transport Pilot License (ATPL), underlining a significant proportion of individuals with the highest level of piloting credentials.

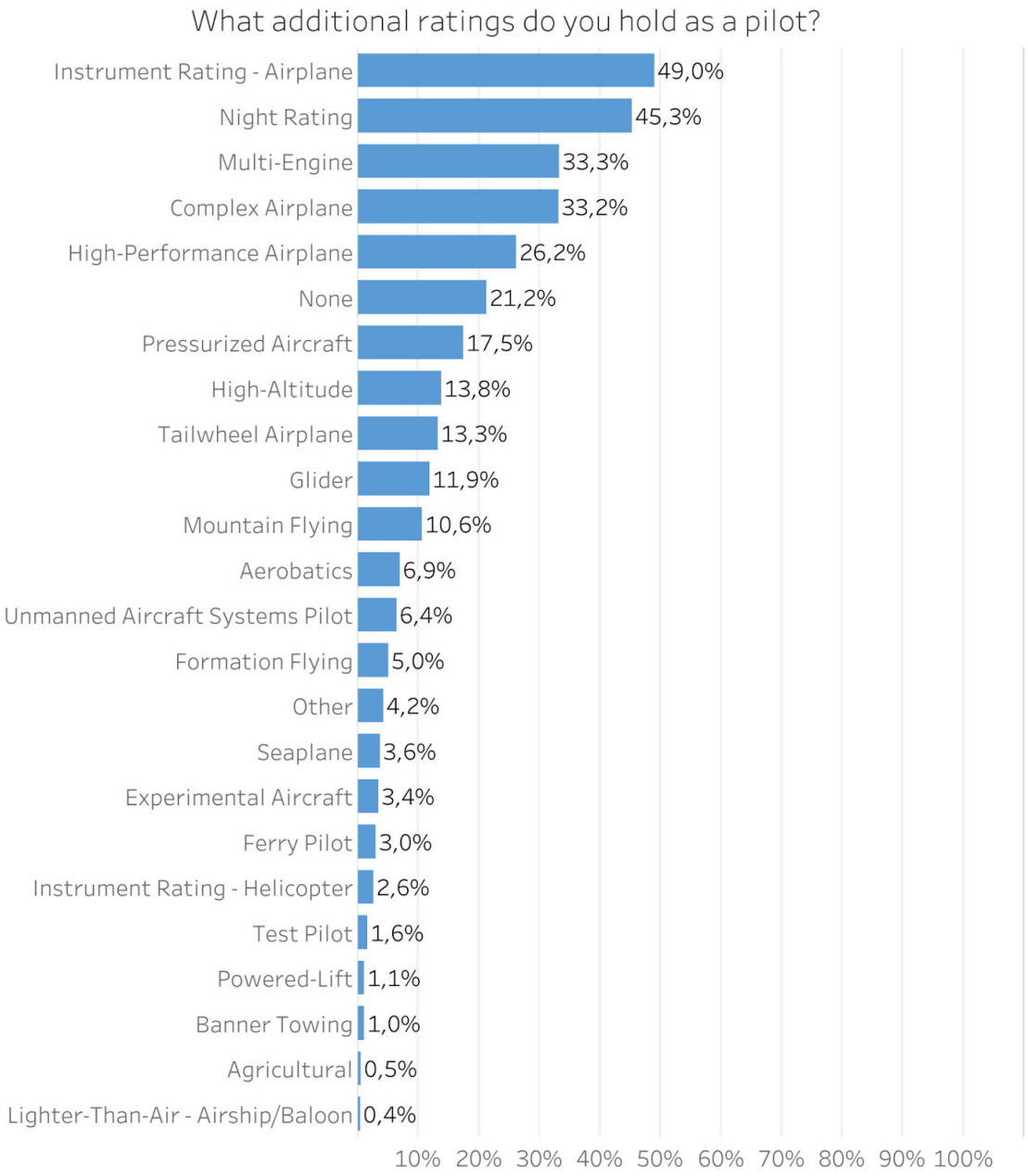


Last year's results:



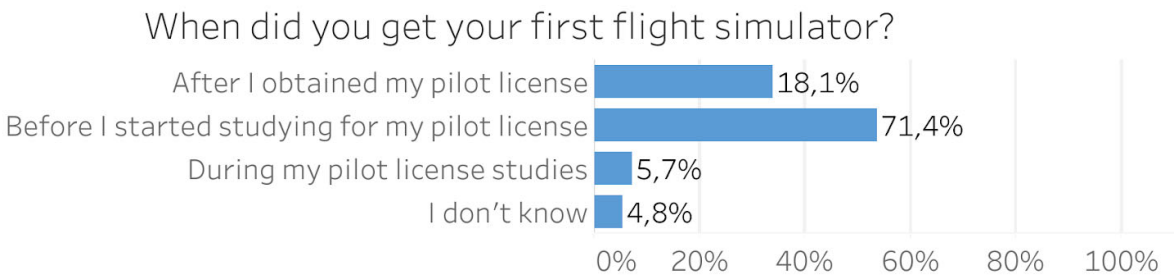
3.3.2.2. Additional Ratings

The respondents who stated that they hold a pilot license were also asked what additional ratings they possess. Among those who responded to this question, approximately half of the respondents hold an Instrument Rating - Airplane. Additionally, 45.7% have a Night Rating, 33.6% possess a Multi-Engine Rating, and 33.5% hold a Complex Airplane Rating.



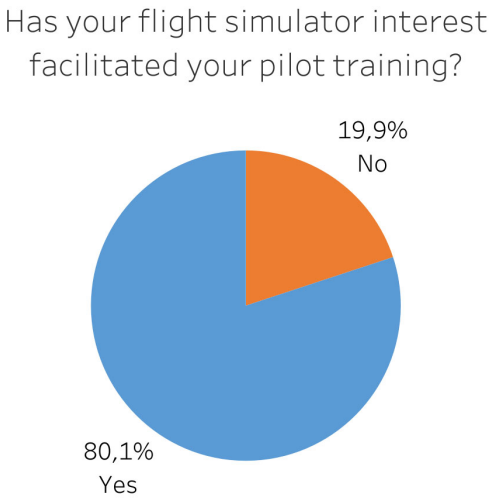
3.3.3. Simulator Relative to Training

In this question, our aim was to explore the potential impact of flight simulation on pilot training. Therefore we asked respondents with a pilot license about when they first acquired a flight simulator. Similar to the 2021 survey, the majority of respondents indicated “Before I started studying for my pilot license”. This year, over 70% of the respondents reported having their first simulator before obtaining a license. This persistent pattern underscores the enduring impact of flight simulation as a prelude to formal aviation training, suggesting its integral role in shaping the early experiences and skill development of aspiring pilots.

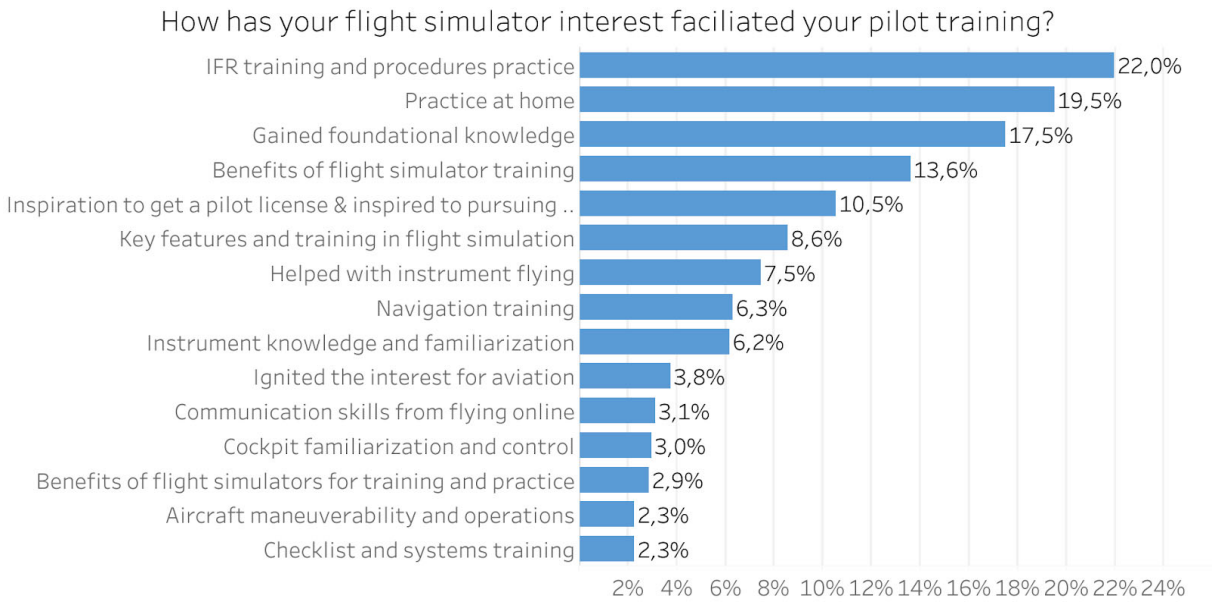


3.3.3.1. Simulator Facilitation on Training

We proceeded to inquire further with respondents holding pilot licenses, exploring whether their interest in flight simulation had positively influenced their pilot training. The diagram below illustrates that four out of five pilots acknowledge that their engagement in flight simulation has indeed facilitated their pilot training.



We also asked pilots how it has facilitated their training. With help from AI, we analyzed the free text fields. The findings indicate that the simulator has proven beneficial not only for Instrument Flight Rules (IFR) training, but also for acquiring fundamental knowledge and serving as a source of inspiration.



1. **Instrument Scanning and Procedures**: Respondents report that flight simulators are effective in enhancing instrument scanning skills, particularly in IFR scenarios. They highlight the simulator's role in practicing and developing these skills.
2. **Diverse Training Applications**: Flight simulators are used for a variety of training purposes including practicing instrument procedures, learning cockpit flows, handling different aircraft types, and enhancing navigational techniques. They are seen as valuable for maintaining skills and practicing various aviation aspects.
3. **Theoretical Knowledge and Preparation**: Users credit flight simulators with providing a strong theoretical foundation in aviation. Simulators introduce fundamental concepts and are considered helpful in preparing for real-world flying, saving time and money in flight training.
4. **Realism and Entertainment Value**: The realism offered by flight simulators is highly valued, as is their ability to simulate real-world flying experiences. Users also appreciate the entertainment aspect and the use of flight simulation peripherals.
5. **Instrument Operations Knowledge**: The importance of understanding and operating instruments effectively is a common theme. Simulators are used to enhance navigation and situational awareness through instrument use.
6. **Instrument Flying Skills Practice**: Simulators are recognized as key tools for practicing instrument approaches and procedures, especially for those undergoing instrument rating training.
7. **Passion for Aviation and Pilot Training**: Flight simulation is often credited with sparking a passion for aviation and influencing decisions to pursue pilot

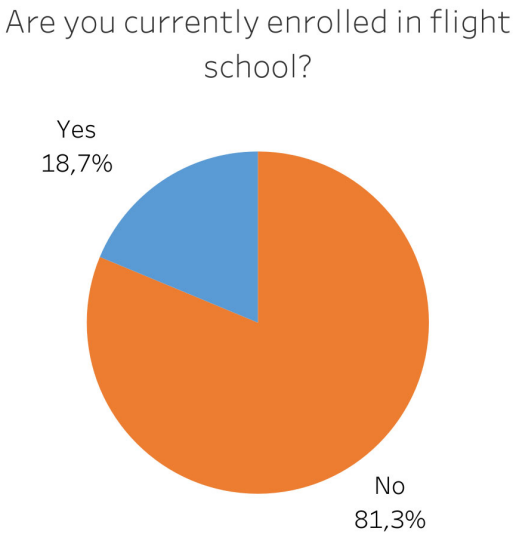
training and careers in aviation. They are seen as crucial for skill development and IFR competency.

8. **ATC Communication Skills**: Using simulators to improve skills in ATC communications and to stay current with aviation procedures is a notable benefit mentioned by respondents.
9. **Familiarization with Aircraft and Airspace**: Simulators aid in cockpit familiarization, airport and airspace understanding, and learning flight controls and procedures.
10. **Flight Physics and Aerodynamics**: Users find simulators helpful in understanding complex aviation physics, such as aerodynamics and avionics.
11. **Inspiration and Motivation**: Flight simulators are described as inspirational tools, encouraging users to explore their interest in aviation, whether for hobby or professional pursuits.
12. **Controls and Effects Understanding**: The experience of managing controls, understanding the effects of control surfaces, and coordinating actions is enhanced through simulator use.
13. **Chart Reading and Interpretation**: Respondents find simulators useful for improving their skills in reading and interpreting aviation charts.
14. **Systems Knowledge and Checklists**: Practicing and understanding aircraft systems and checklists is another key use of flight simulators, enabling systematic and structured learning.
15. **VATSIM and Online Flying Networks**: Online networks like VATSIM are used in conjunction with simulators to practice aviation communications and procedures in a realistic environment.
16. **Comprehensive Knowledge and Learning**: Simulators offer an opportunity for comprehensive learning about flight principles, aviation theory, and real-world scenarios.

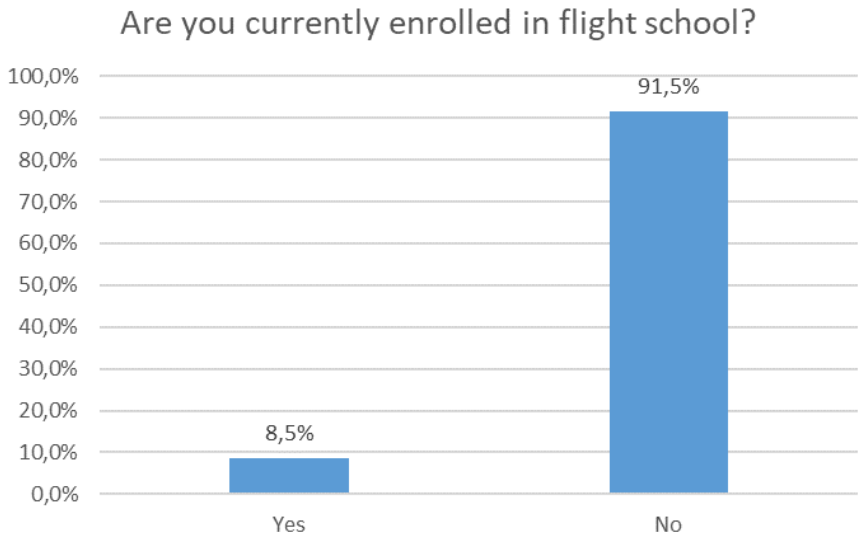
In summary, flight simulators are highly valued in the aviation community for their role in enhancing instrument flying skills, procedural training, navigational abilities, and overall aviation knowledge. They are considered essential tools for both aspiring and current pilots to improve their skills, knowledge, and passion for aviation.

3.3.4. Flight School Enrollment

In the examination of respondents affirming possession of a pilot's license, 19% disclosed current enrollment in flight school. Unfortunately, there was a discrepancy in the survey logic and a direct comparison with the previous year's results is unfeasible, given that the question pertaining to enrollment was posed to the entire respondent pool in the prior survey. In previous years, this question was only posed to those who stated not to be in possession of a pilot's license.

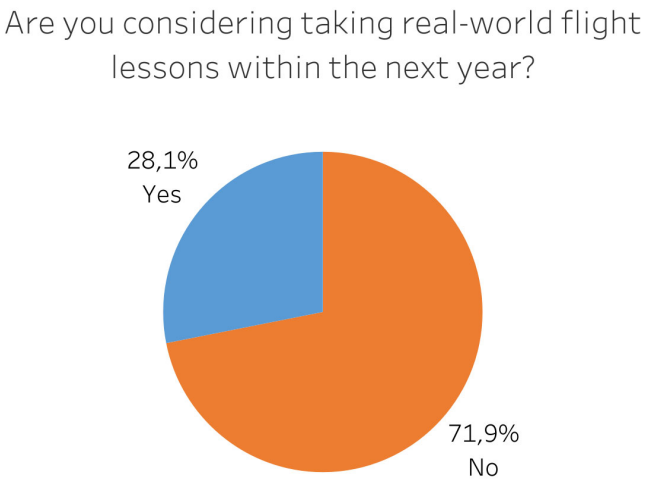


Last year's result:



3.3.5. Flight Lesson Consideration

When it comes to considering taking real-world flight lessons within the next year, the results are comparable to last year, where more than one in four is considering taking real-world flight lessons.



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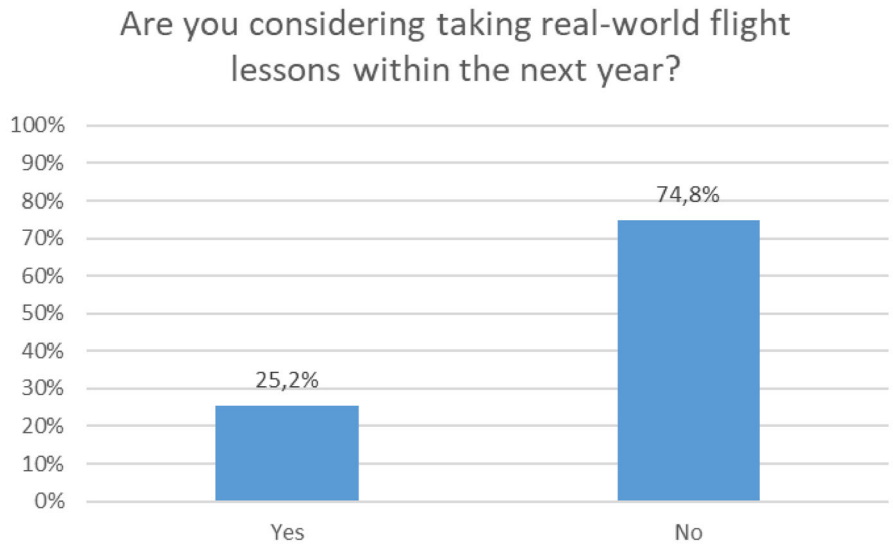
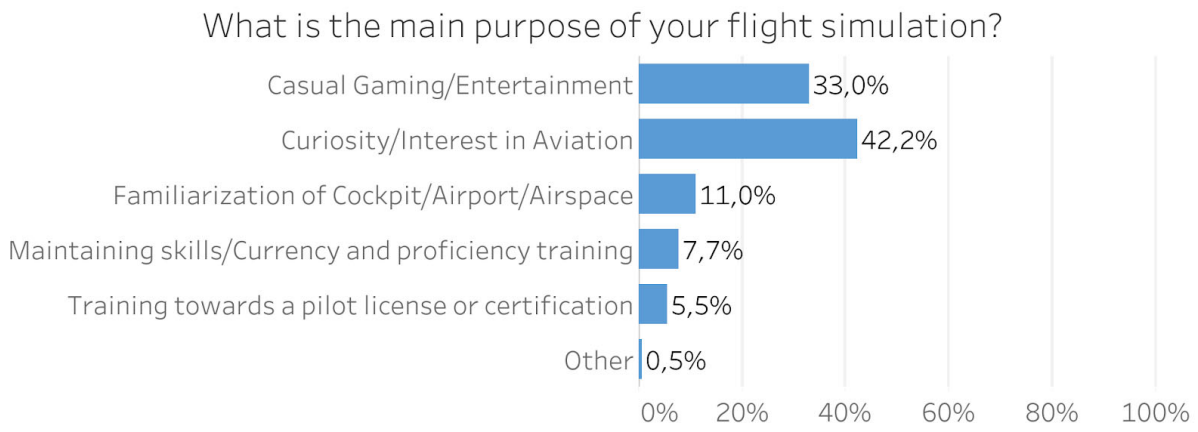


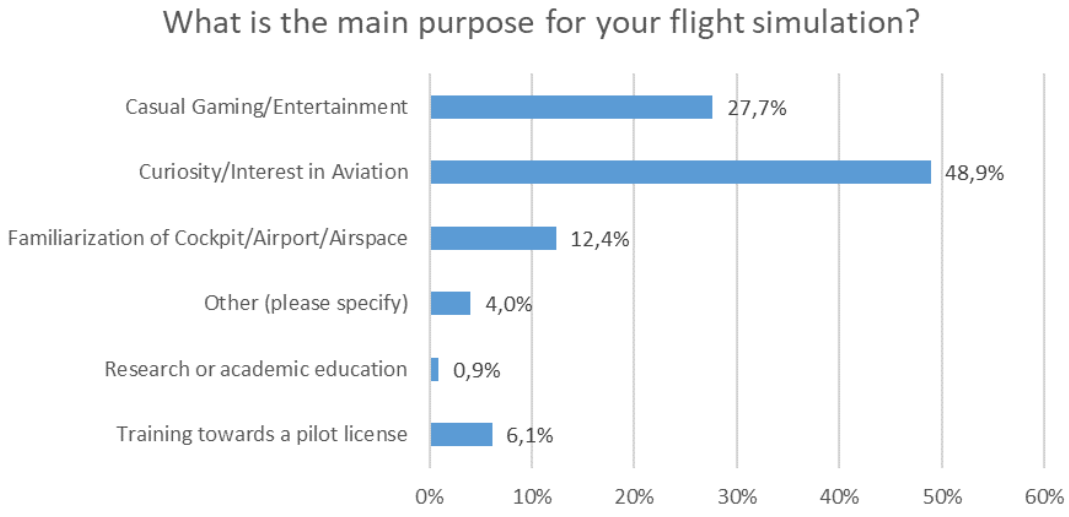
3.4. Intention

3.4.1. Purpose

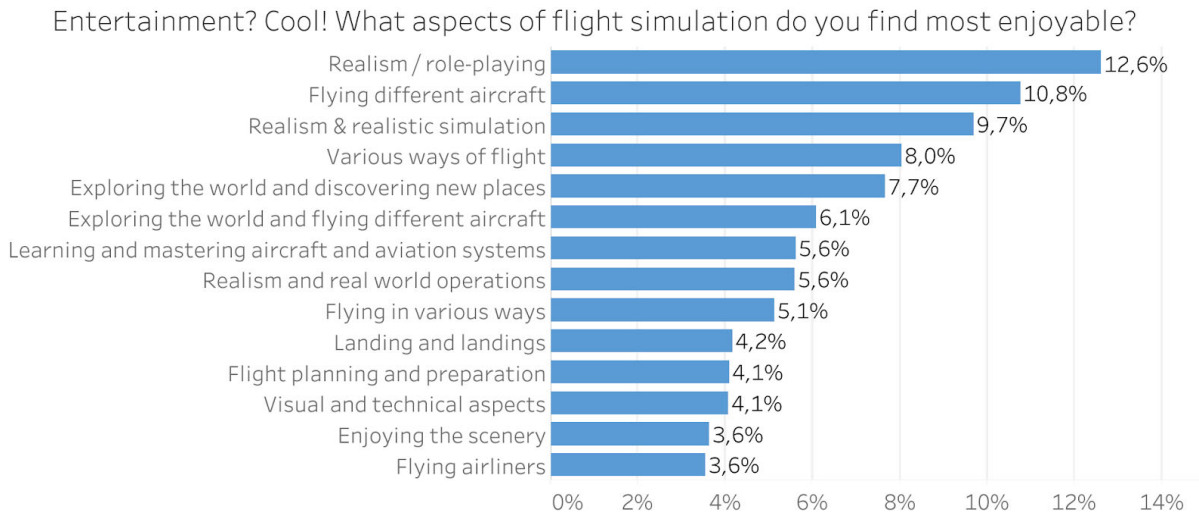
The findings concerning the primary purpose of flight simulation are seemingly similar; nonetheless, a notable shift is observed over the last two years. Specifically, the category “Casual Gaming/Entertainment” has gained 7.8 percentage points, whereas “Curiosity/Interest in Aviation” has experienced a decline of 8.8 percentage points. This year, we introduced the option “Maintaining skills/Currency and proficiency training”, chosen by 7.7% of the respondents, adding a new dimension to the evolving landscape of flight simulation motivations.



Last year’s result:



We also asked follow-up questions to understand why the respondents selected the main purpose they did. The responses were collected as text fields, and underwent analysis aided by artificial intelligence for a comprehensive understanding.



1. **Exploration and Scenery**: Many enjoy the ability to virtually travel to different parts of the world, exploring new places and airports, and experiencing the views from high altitudes. This includes sightseeing famous landmarks and navigating through visually appealing environments.
2. **Learning and Skill Development**: Respondents appreciate the educational aspect of flight simulation, learning about specific airplanes, aircraft systems, flying skills, and real-world flight operations. The complexity and technicality of mastering different aircraft and aviation procedures are highly valued.
3. **Flight Planning and Navigation**: The process of planning flights, including setting up flight plans, programming the FMC, and executing checklists, is enjoyable for many. This also encompasses navigation skills, using instruments, and the challenge of getting from point A to point B.
4. **Variety of Aircraft and Operations**: The ability to fly different types of aircraft and engage in various types of operations, such as commercial airline flying, bush flying, or military operations, is a significant draw. This includes flying historical or vintage planes, large airliners, and simulating different scenarios.
5. **Community and Social Interaction**: The social aspect of flight simulation, including flying with friends, interacting with ATC and being part of a community of simmers, is a key enjoyment factor. Community events and multiplayer experiences are particularly valued.
6. **Challenge and Accomplishment**: Respondents enjoy the challenges posed by flight simulation, such as navigating through difficult weather, takeoffs and landings, and mastering complex systems. The sense of accomplishment after a successful flight or landing is highly rewarding.
7. **Relaxation and Escapism**: For many, flight simulation is a form of relaxation and escapism, offering a peaceful and calming experience away from

everyday stresses. The serenity of flying and the opportunity to unwind are important aspects.

8. **Personal and Professional Interests**: Some respondents have a personal or professional interest in aviation, using simulation to explore these interests further, whether for career development or personal passion.
9. **Technological Enjoyment**: The advancements in graphics, sounds, and virtual reality technology are also aspects that enhance the enjoyment of flight simulation. The ability to customize and mod the simulator adds to this enjoyment.
10. **Airline and Commercial Focus**: A significant number of respondents specifically enjoy aspects related to commercial aviation and flying airliners, including simulating real airline operations and flying specific aircraft models.

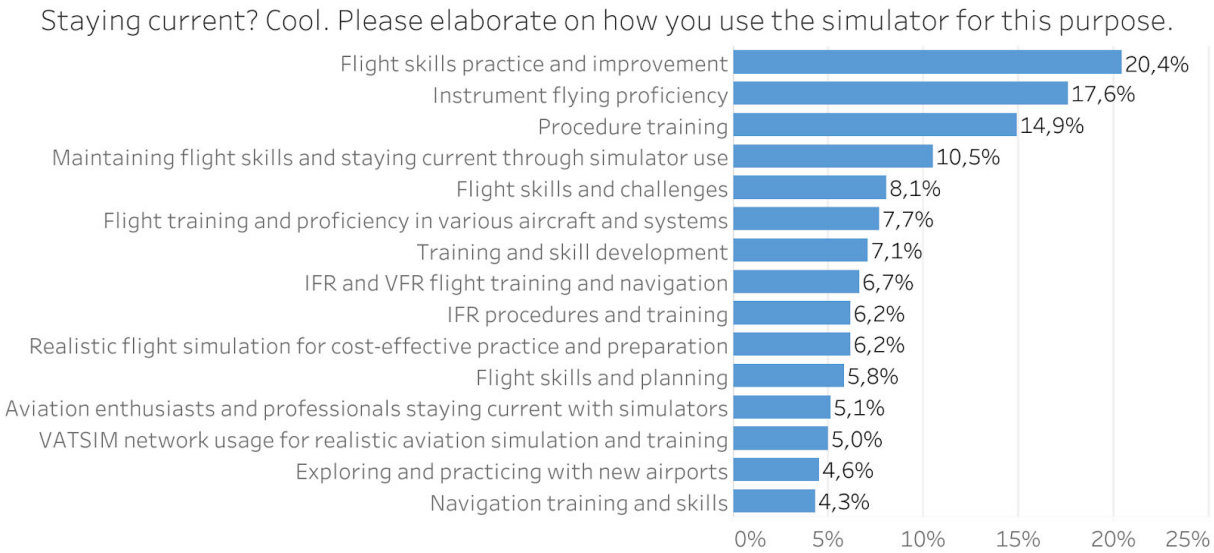
In summary, the enjoyment of flight simulation is multifaceted, encompassing realism, exploration, learning, planning, variety in aviation experiences, community interaction, the challenge and sense of accomplishment, relaxation, personal interests, technological advancements, and a focus on commercial aviation.

When it comes to the follow-up question “Training? Nice! Tell us a bit how you use the simulator for this purpose.”, a graph representation is not feasible due to insufficient number of responses for the training question. Our commitment to maintaining the integrity of our visualizations led us to make this decision, ensuring that the charts accurately reflect the survey data. We have still provided the AI analysis for this question which offers a comprehensive exploration of the available insights.

1. **Instrument Rating Preparation**: The simulator is an invaluable tool for those preparing for their instrument rating, as it allows for the practice of flying solely by reference to instruments. This is crucial for flying in low visibility conditions and teaches pilots to trust their instruments over their senses.
2. **Advanced ATC Interaction**: Practicing with ATC, especially on networks like VATSIM, provides a realistic environment for learning how to communicate effectively with air traffic controllers. This training is essential for understanding ATC instructions, phraseology, and for developing situational awareness.
3. **Aircraft Systems Mastery**: Pilots use the simulator to familiarize themselves with the various systems onboard different aircraft. This includes understanding the functionality of navigation systems, engine management, fuel systems, and emergency systems, which is critical for safe and efficient aircraft operation.
4. **Procedural Training**: The simulator is used to practice standard operating procedures and emergency procedures. This includes everything from

pre-flight checks and take-off procedures to handling in-flight emergencies and unusual situations, which enhances a pilot's readiness for real-world scenarios.

5. **Regulatory Knowledge**: Flight simulation help pilots understand and comply with aviation regulations. By practicing in scenarios that are bound by real-world rules and guidelines, pilots can better learn the legal aspects of flying, airspace regulations, and international aviation standards.
6. **Meteorology and Weather Understanding**: Pilots use the simulator to learn how to navigate and fly in various weather conditions. This includes understanding the effects of wind, turbulence, icing, and other meteorological phenomena on the aircraft, which is crucial for flight planning and safety.
7. **VFR and IFR Flying Skills**: Training in both Visual Flight Rules and Instrument Flight Rules is essential. The simulator provides an environment to practice these skills in both clear and adverse weather conditions.
8. **Radio Communication Skills**: Effective radio communication is a vital skill for pilots. The simulator provides an environment to practice this, including learning the correct aviation phraseology, making position reports, requesting flight clearances, and responding to ATC instructions.
9. **Familiarization with Diverse Aircraft Types**: The simulator allows pilots to experience flying a wide range of aircraft, from small single-engine planes to large commercial jets. This exposure is invaluable for understanding the performance characteristics, handling, and systems of various aircraft types.



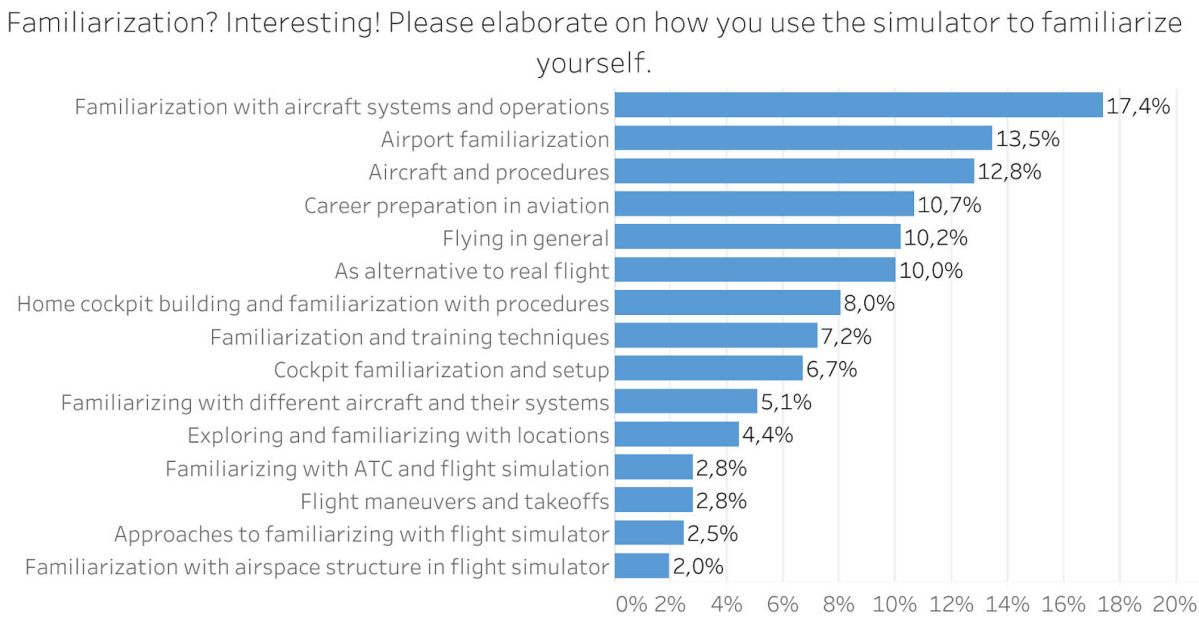
1. **Familiarization with Various Aspects**: Users practice aircraft systems, airspace and airport procedures, approaches to new airports and destinations, and refresh their understanding of different routes, takeoffs, and landings.
2. **Instrument Flight Practice**: A significant focus is on practicing instrument approaches, precision and non-precision procedures, flying in unfamiliar airspace, simulating inflight failures, and emergency procedures.
3. **Variety of Practice Forms**: Respondents use simulators for pattern work, navigation, knowledge testing, learning new technology, and practicing in IMC conditions, providing a cost-effective way to maintain flight skills.
4. **Procedure Familiarity**: There's a strong emphasis on following and refining both normal and non-standard procedures, staying updated on changing company procedures, and drilling them to keep them fresh.
5. **Preparation for Proficency Checks and Specific Training**: Simulators are used for preparing proficiency checks, specific airport training, enhancing hand flying capabilities, and practicing emergencies and avionics systems.
6. **Instrument Flying and Weather Challenges**: Many respondents focus on instrument flying, particularly in bad weather or IMC conditions, and also engage in activities like mountain-flying and formation flying.
7. **Comprehensive Skill Maintenance**: Users engage in flight plan reviews, dry runs, emergency procedures, and maintaining airport and procedure knowledge, also utilizing tools for research and technical understanding.
8. **Diverse User Backgrounds**: Users include former licensed VFR pilots, retired pilots, aviation enthusiasts, aircraft engineers, and technicians, using simulators for skill maintenance, knowledge enhancement, and passion for aviation.
9. **Realism in Simulation**: Many aim for high realism in simulation, using real world procedures, expected directs, and realistic weather conditions, with some using virtual reality and realistic hardware.
10. **Online Networks**: Online networks are commonly used for practicing real-world procedures, interacting with air traffic controllers, and simulating various scenarios.
11. **Training Focus**: Training encompasses procedural, instrument, emergencies, system understanding, and transitions, emphasizing theory application and specific procedure practice.
12. **Navigation Proficiency**: Many users are mentioning various tools that are used for navigation practice, including radio navigation, VOR-navigation, and enhancing emergency response.
13. **Aerial Demonstration Teams and Realistic Flying**: Users fly in aerial aerobatic demonstration teams, use aircraft matching their real-life experience, and recreate accident scenarios, focusing on maintaining proficiency in various flight and weapon systems.

14. **Approach Practice**: Focus on various approach types, including missed, precision, and non-precision, as well as technique and type knowledge, especially in challenging conditions.
15. **Instrument Currency and Familiarity**: Emphasis on staying familiar with instruments, new devices, and systems, reading charts, and learning about emergency profiles.
16. **Knowledge Maintenance and Simulation Software**: Simulators are utilized for maintaining and deepening knowledge, transitioning to new technology, practicing cockpit procedures, and staying sharp with workflows.
17. **Emergency Procedures and Drills**: Many respondents practice emergency procedures, focusing on preparing for emergencies and staying proficient in handling them.
18. **Helicopter and Mixed Flight Practices**: Includes helicopter IFR, VFR traffic pattern, maintaining IFR in low-visibility conditions, and various IFR and VFR flights.
19. **Instrument Proficiency and Bi-Annual Reviews**: The simulator is used for maintaining instrument proficiency, specific approach practice, and additional training for instructors.
20. **Mental Engagement and Awareness**: Respondents emphasize the importance of mental awareness in areas like phraseology, mind tasks, and route planning.
21. **Routine Practice and Weather Challenges**: Regular practice in the simulator is common, focusing on departure procedures, weather challenges, and maintaining general confidence in the air.
22. **Flight Planning and Execution**: Cross country flights, traffic patterns, and approaches are commonly practiced, with tools like Foreflight and Skydemon being used for flight planning.
23. **Diverse Reasons for Simulator Use**: Individuals with various limitations or circumstances, such as medical issues or retirement, use simulators to maintain skills or for revalidation purposes.
24. **IFR Training and Familiarization**: Focus on IFR procedures, approaches, and flights, including conventional and emergency procedures training.
25. **Emergency and General Procedure Practice**: Users focus on emergency procedure training, radio work, and type rating, practicing in different weather conditions.
26. **Challenging Operations and Skill Maintenance**: Simulators are used to maintain muscle memory, motor skills, hand-flying, and radiology skills, providing a challenge and keeping skills fresh.
27. **Diverse Operations and Non-Normal Procedures**: Flight simulators are used for airline and IFR operations, cockpit familiarity, and practicing IFR communications, as well as for entertainment.
28. **Landing Techniques and Different Weather Conditions**: Practice includes proper sequences, circuits, forced landings, slow flight, and crosswind landings.

29. **Enjoyment and Specific Procedure Practice**: Respondents use simulators for enjoyment, specific procedure practice, maintaining muscle memory, and flying in IMC.
30. **Checklist Consistency and Memorization**: The importance of consistently using and memorizing full checklists is highlighted.
31. **Cockpit Familiarization and Instrumentation Understanding**: Emphasis on familiarizing with the cockpit, understanding instrumentation, and managing the cockpit effectively.
32. **Maneuvers and Communication Skills**: Practicing various maneuvers like circle to land, helicopter maneuvers, and improving radio communication skills.
33. **Staying Updated and Agile**: Keeping current with airspace, new techniques, flight planning, navigation, night flying, and staying mentally current.
34. **Standard Operating Procedures and Real-World Scenarios**: Focus on practicing and refining procedures, approaches, scenarios, and real-world procedures.
35. **Flows and Procedures**: Practicing usual flows, checklist flows, emergency procedures, and memory items.
36. **Familiarization with Airports and Areas**: Flying circuits at familiar or intended airports, pre-flying routes, and familiarizing with unknown areas.
37. **Diverse Aircraft Practice**: Practicing with different aircraft types, focusing on systems, flows, handling, and performance factors.
38. **Personal Enjoyment and Skill Reproduction**: Using the simulator for fun, relaxation, and reproducing missions from one's career.
39. **Virtual Flight Schools and Mentoring**: Utilizing virtual flight schools, practicing VFR flight skills, and maintaining understanding of aircraft systems and procedures.
40. **Communication Skills and Technologies**: Practicing new telecommunication technologies, ATC communications, radio communication skills, and standard radio phraseology.
41. **Recreating Real-World Flights**: Using simulators to recreate real-world flights, practicing real flight procedures, and flying as realistically as possible.
42. **Mimicking Real-World Operations**: Practicing company procedures, training maneuvers, standard operating procedures, emergency and abnormal scenarios.
43. **Maneuvers and Situational Awareness**: Practicing circuits, stalls, touch n go's, cross country flights, fuel management, holds, and formation flying.
44. **Failure and Procedural Training**: Preparing for check rides with programmable failures, training on failure or rare events, and incorporating failure management.
45. **Instrument Scanning and Chart Reading**: Practicing instrument scanning, reading charts and instruments, and acclimating to instrument meteorological conditions.

46. **Diverse Motivations for Simulator Use**: Reasons range from maintaining skills post-retirement to financial constraints, enjoyment, and simulation of emergency landings.

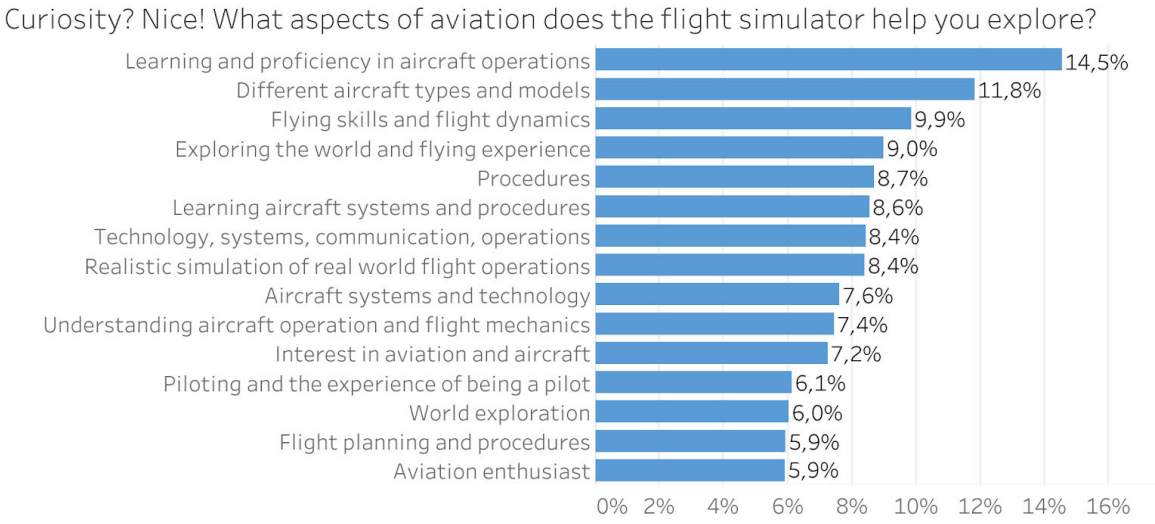
Overall, flight simulators serve as a multifaceted tool for a wide spectrum of users, from aviation professionals to enthusiasts. They offer a cost-effective, realistic, and comprehensive platform for maintaining, enhancing, and enjoying flight skills.



1. **Aircraft Familiarization:**
    - Users extensively utilize the simulator to gain hands-on experience with various types of aircraft, including airliners, business jets, gliders, helicopters, and general aviation planes.
    - They explore the systems, performance characteristics, and operational nuances of different aircraft models, aiming to understand and interpret these systems better.
    - Simulators are used for practicing standard procedures, emergency scenarios, and understanding specific operational techniques of various aircraft models, including study-level aircraft for in-depth learning.
2. **Airspace Familiarization:**
    - The simulator serves as a tool for learning about different types of airspace, their rules, and structures. This includes practicing both IFR and VFR procedures.
    - Realistic air traffic control communication is practiced through platforms like VATSIM, enhancing users' familiarity with ATC procedures and terminology.

    - Users engage in navigation practice, using tools like Navigraph maps and GPS systems, to familiarize themselves with navigation techniques in different airspaces.
3. **Airport Familiarization:**
    - Simulators are employed to explore and understand the layouts and operational procedures of various airports. This includes studying airport charts, procedures, and layouts.
    - Users practice approaches, takeoffs, and taxiing at different airports, simulating the experience of flying to various airports around the world.
    - The simulator allows users to replicate real-world flights, including practicing the exact procedures and routes they would encounter at actual airports.
4. **Real-World Scenario Simulation:**
    - Users appreciate the ability to simulate real weather conditions, testing aircraft behavior in special weather scenarios, and enhancing their meteorological understanding.
    - Emergency situations and special procedures are simulated to enhance readiness for real-world challenges in different airspaces or airports.
5. **Skill Development and Proficiency:**
    - The simulator is a key tool for understanding the basics of aviation, pilot skills, and airmanship. Users focus on learning flows, procedures, and improving their aircraft identification skills.
    - For those pursuing aviation careers or certifications, simulators provide a platform to prepare for real-world training and licenses, and to maintain and train for certifications.
6. **Realism and Immersion:**
    - There is a strong emphasis on creating a simulation experience that closely mimics real-life flying, focusing on realism and authenticity.
    - Users strive to replicate real-life conditions, including controls and procedures, to achieve a high level of immersion.

In summary, flight simulators are a versatile tool used by aviation enthusiasts and professionals alike for familiarizing themselves with various aspects of flying, including specific aircraft types, navigating different airspaces, and operating in diverse airport environments. These tools offer practical experience in a safe and controlled setting, allowing users to enhance their skills and prepare for real-world aviation scenarios.



1. **Comprehensive Aviation Experience**: Respondents highlight the simulator's role in providing a wide-ranging experience of aviation. This includes familiarization with different aircraft systems, practicing flight maneuvers, exploring airports and airspaces, and simulating real-world flight procedures.
2. **Learning and Skill Development**: Many emphasize the simulator's educational value in areas like communication skills with ATC, understanding aviation rules, and mastering technical issues. It's seen as a crucial tool for both casual learners and those pursuing aviation careers.
3. **Career and Hobby Exploration**: Users appreciate the simulator's role in exploring aviation as a hobby or potential career. This extends to understanding the roles and responsibilities of ATC, and gaining insights into the daily life of pilots and air traffic controllers.
4. **Technical Insight and Realism**: Respondents are impressed with the simulator's ability to provide in-depth understanding of technical aspects, such as aircraft control, performance, and avionics. The realism in simulating flight dynamics, aircraft behavior, and real-world scenarios is also highly valued.
5. **Recreation and Escapism**: Many users view the simulator as a source of entertainment and a way to fulfill their dreams of flying. It's seen as a means of escapism, offering the chance to fly to different locations and experience the joy of aviation.
6. **Accessibility and Practicality**: The simulator is appreciated for its accessibility, providing a budget-friendly and safe environment for practicing and preparing for real-world flights. It's also valued as a substitute for real flying, especially for those unable to fly due to various limitations.
7. **Social Interaction and Community Building**: The simulator's capacity for multiplayer interactions and being part of a community of aviation

enthusiasts is highlighted. It provides a platform for social flying, sharing experiences, and learning collectively.

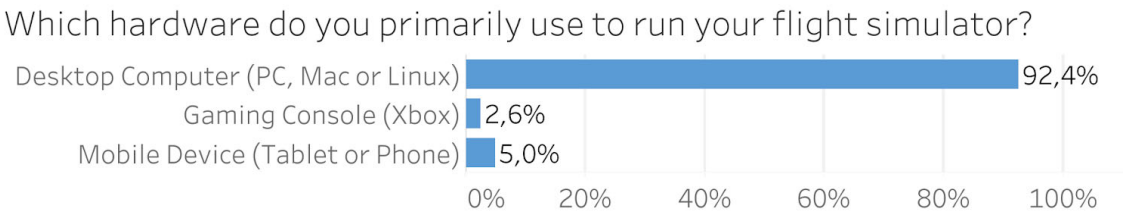
8. **Enhanced Understanding of Aviation**: Users note that the simulator helps in gaining a comprehensive understanding of aviation, including the technicalities of aircraft, coordination with ATC, and navigating various scenarios. It's seen as an all-encompassing tool for exploring all aspects of aviation.

In summary, these responses reflect a broad appreciation for flight simulators as versatile tools that offer a mix of educational benefits, practical training, recreational enjoyment, and a sense of community among aviation enthusiasts. They are valued for both their realistic portrayal of aviation and their accessibility, making them a key resource for anyone interested in exploring the field of aviation.

3.5. Hardware Setup

3.5.1. Primary Hardware

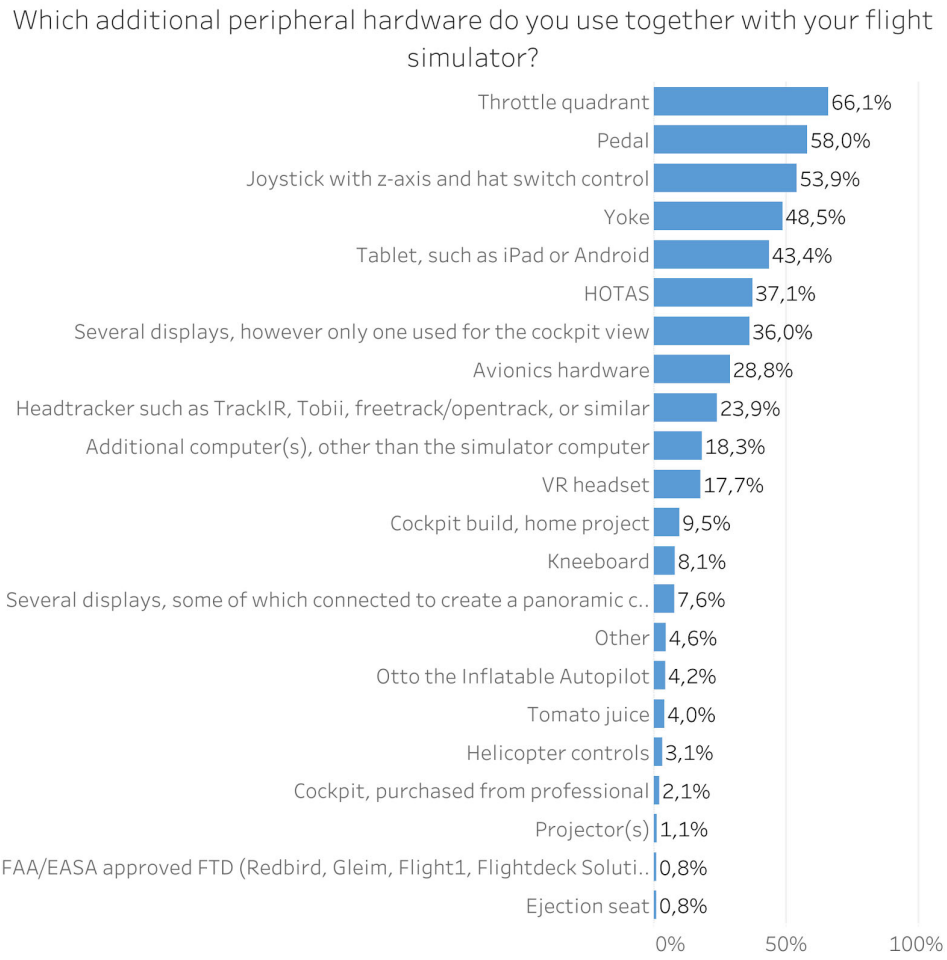
The following question was asked to determine the most common hardware for flight simulation among the respondents. More than nine out of ten survey respondents use Desktop computers (PC, Mac, or Linux).



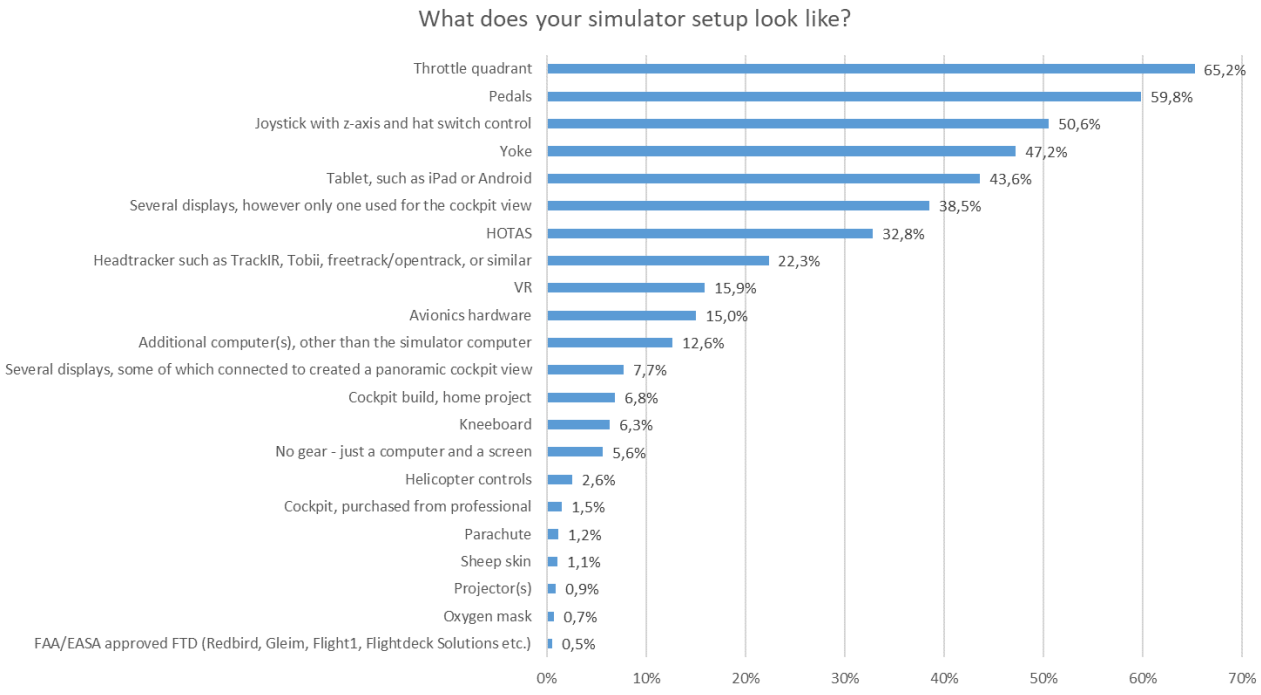
3.5.2. Peripheral Hardware

Several questions have been a continuous presence in the FlightSim Community Survey, with the inquiry about participants' simulator setups being a long-standing fixture. In an effort to enhance clarity, we decided to rephrase the question this to read "What addon peripheral hardware do you use together with your flight simulator?". Despite the adjustment, the top five responses have demonstrated stability, with the majority of respondents reporting ownership of a throttle quadrant, pedal and joystick with z-axis and hat switch control.

Notably, this question also serves as an annual opportunity to introduce a few novel and less conventional response options. Can you identify the new additions in this year's survey?

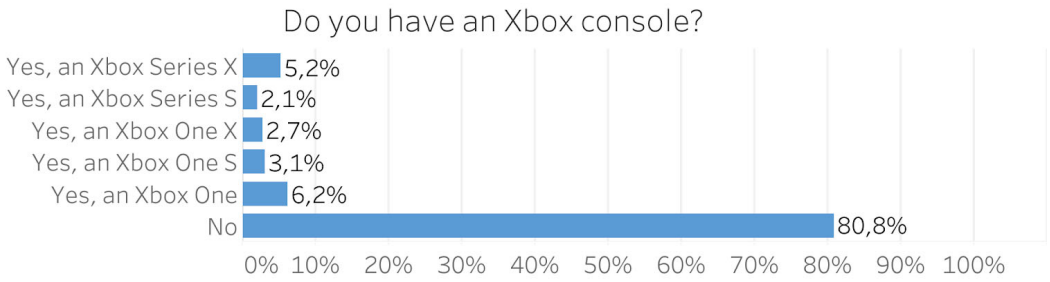


Last year's result:

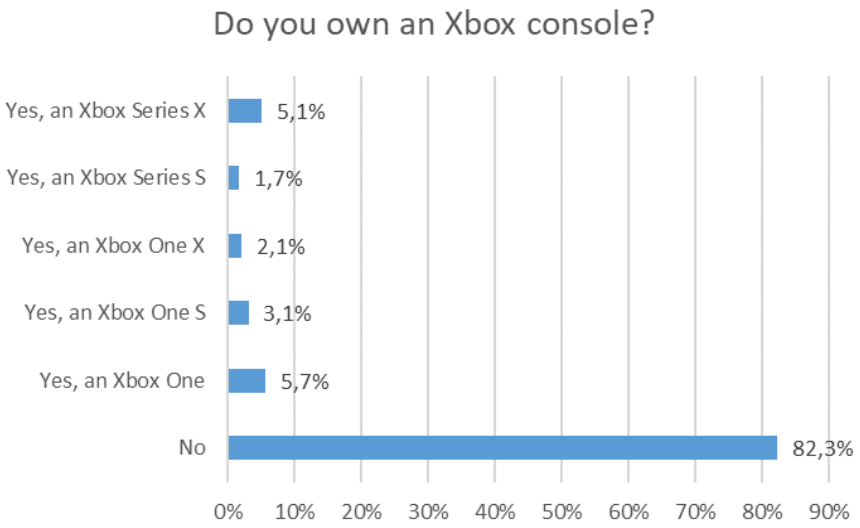


3.5.3. Xbox Consoles

The percentage of Xbox Series X and S users is similar this year compared to 2022. In 2022, the percentage of Xbox Series X users increased from 3.7% to 5.1%, and from 1.3% to 1.7% for Xbox Series S users. Xbox Series X and Xbox Series S are compatible with Microsoft Flight Simulator.



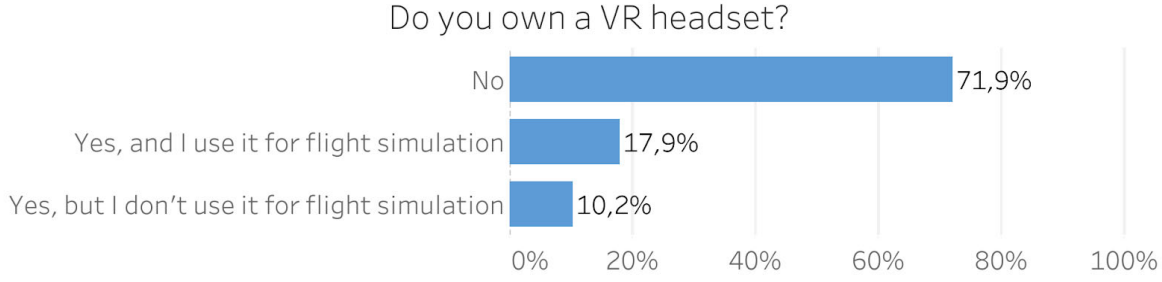
Last year's result:



3.5.4. Virtual Reality

3.5.4.1. Ownership

The subsequent question has been a consistent feature for the past five years. In 2021 and 2022, we saw an increase in respondents owning a VR headset. However, in this year's survey, the figures closely mirror those of the previous year. Despite this, a subtle increase in VR usage for flight simulation can be observed.



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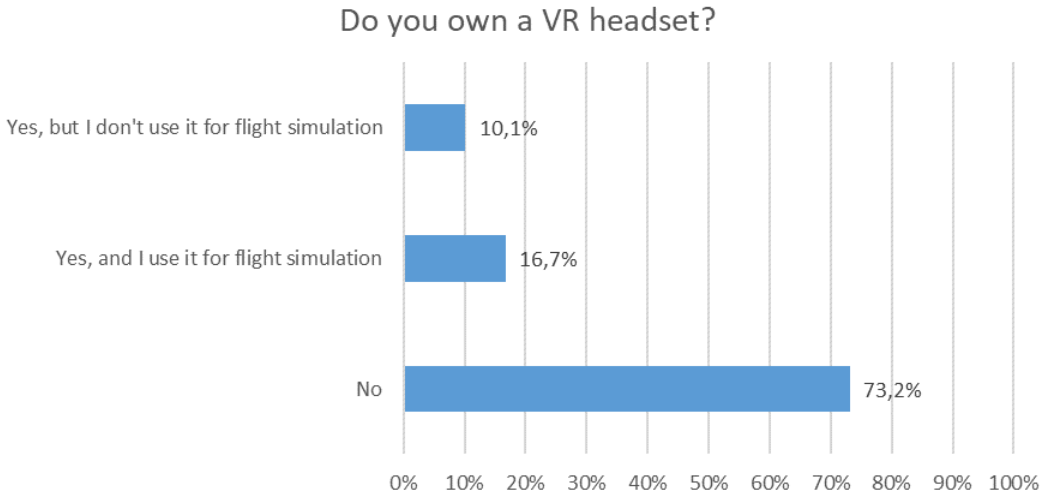
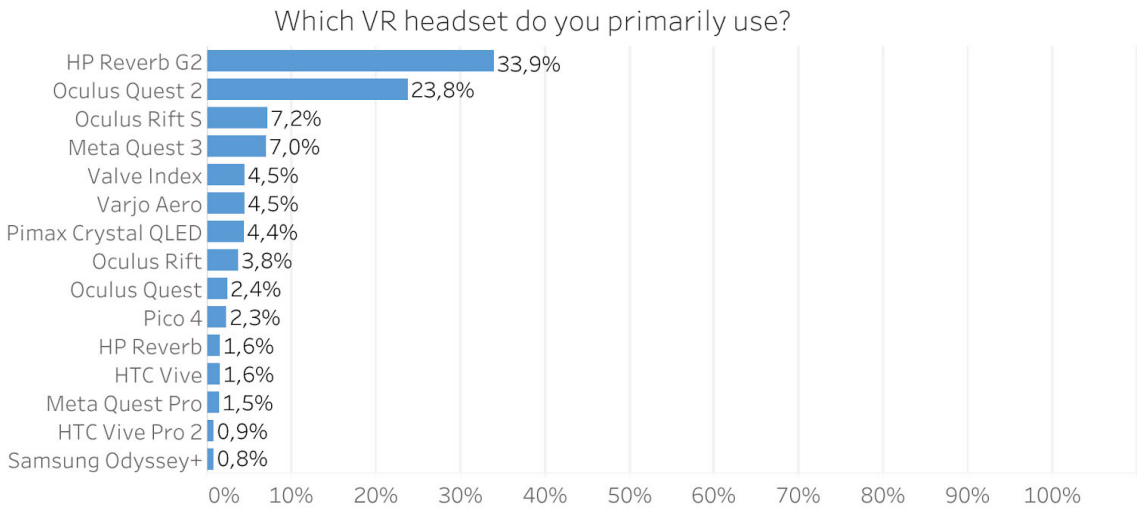


3.5.4.2. Brand

The following graph outlines the preferred VR headsets among the survey respondents. In 2023, the top choices remain unchanged, with HP Reverb G2 retaining its position as the most favored headset. A notable addition to the lineup is the Meta Quest 3, released in October 2023, which swiftly claims the fourth position with a 7.0% user preference.



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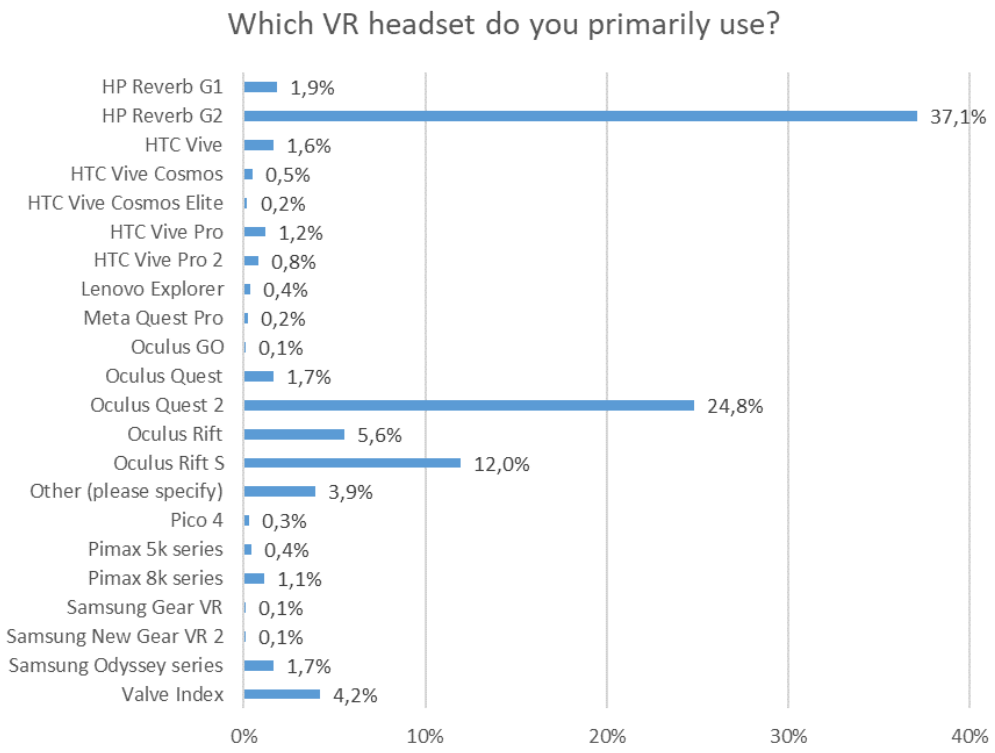
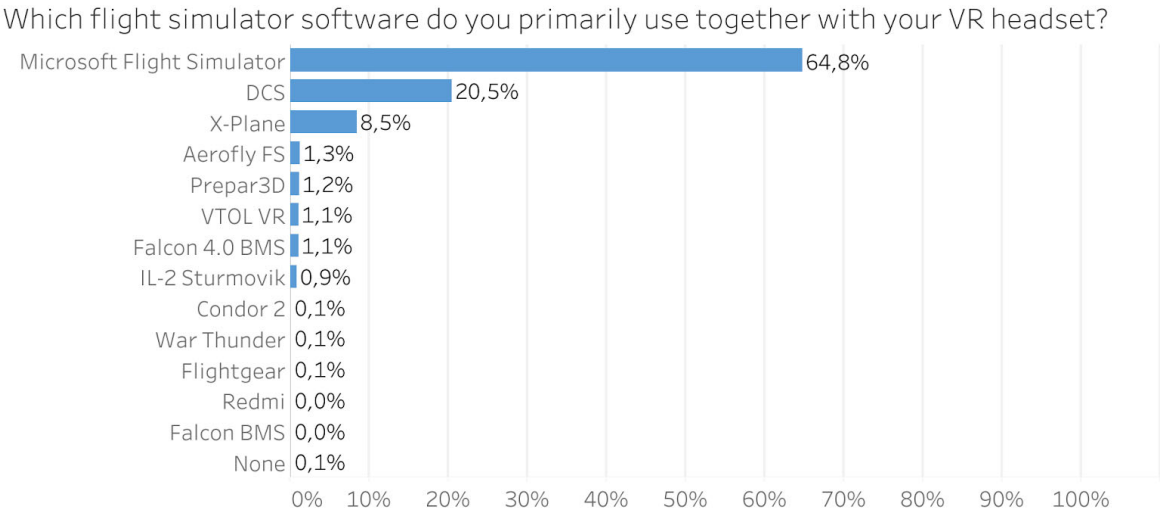
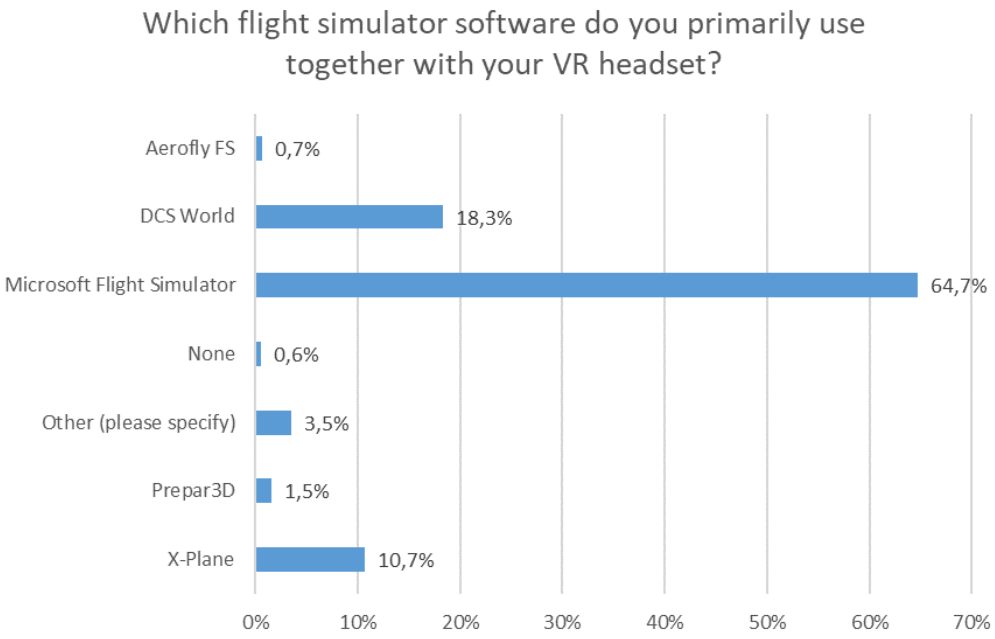


3.5.4.3. VR Simulator Software

According to the survey results, Microsoft Flight Simulator maintains its dominance as the preferred flight simulator software for virtual reality (VR) flying, commanding a significant share of 64.8%. Additionally, the survey highlights sustained popularity for DCS and X-Plane as preferred options for VR-enabled flight simulation experiences.



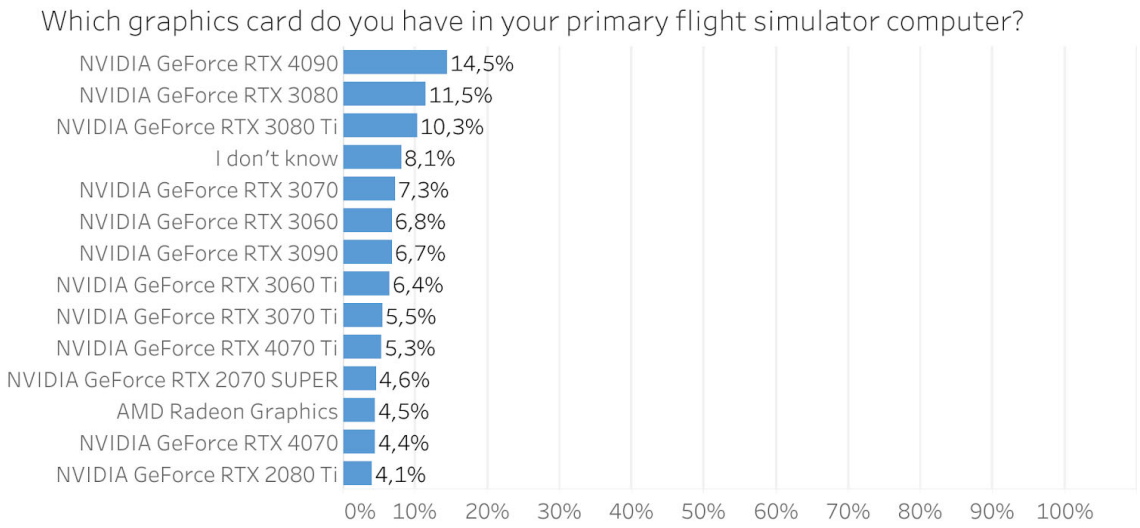
Last year's result:



3.5.5. Graphics Card

In an effort to streamline the presentation of data, this year's survey opted to consolidate all graphics cards into a unified list irrespective of the brand. The ensuing graph shows the top 15 graphic cards based on the respondents preferences.

Notably, The Nvidia GeForce RTX 4090 emerges as the most popular choice, being utilized by 14.5% of the survey respondents. In 2022, only 1.9% of the Nvidia users had a GeForce RTX 4090 graphics card.



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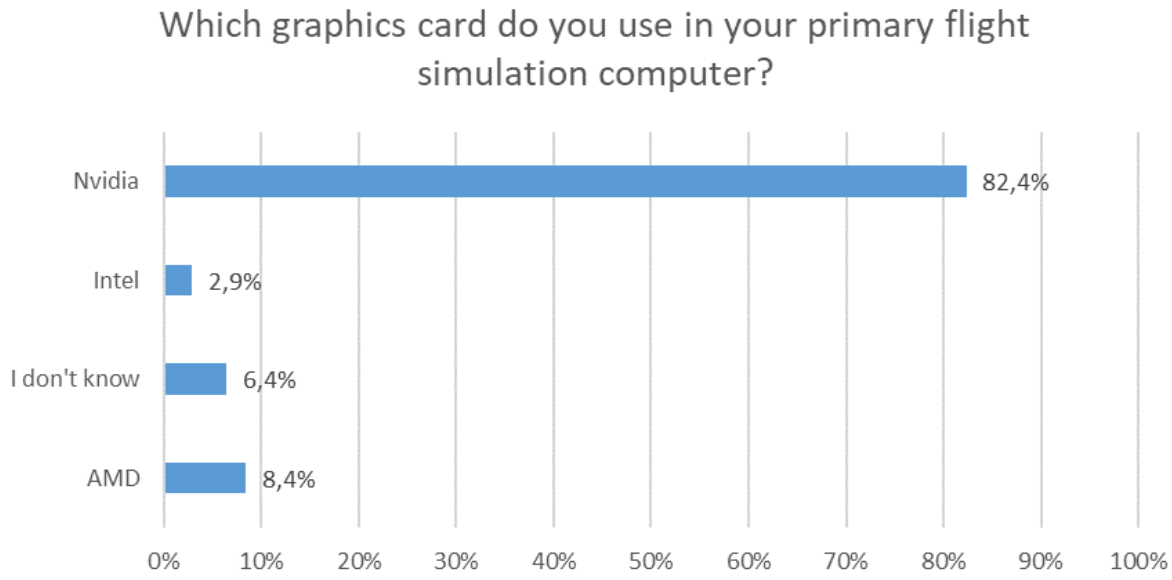
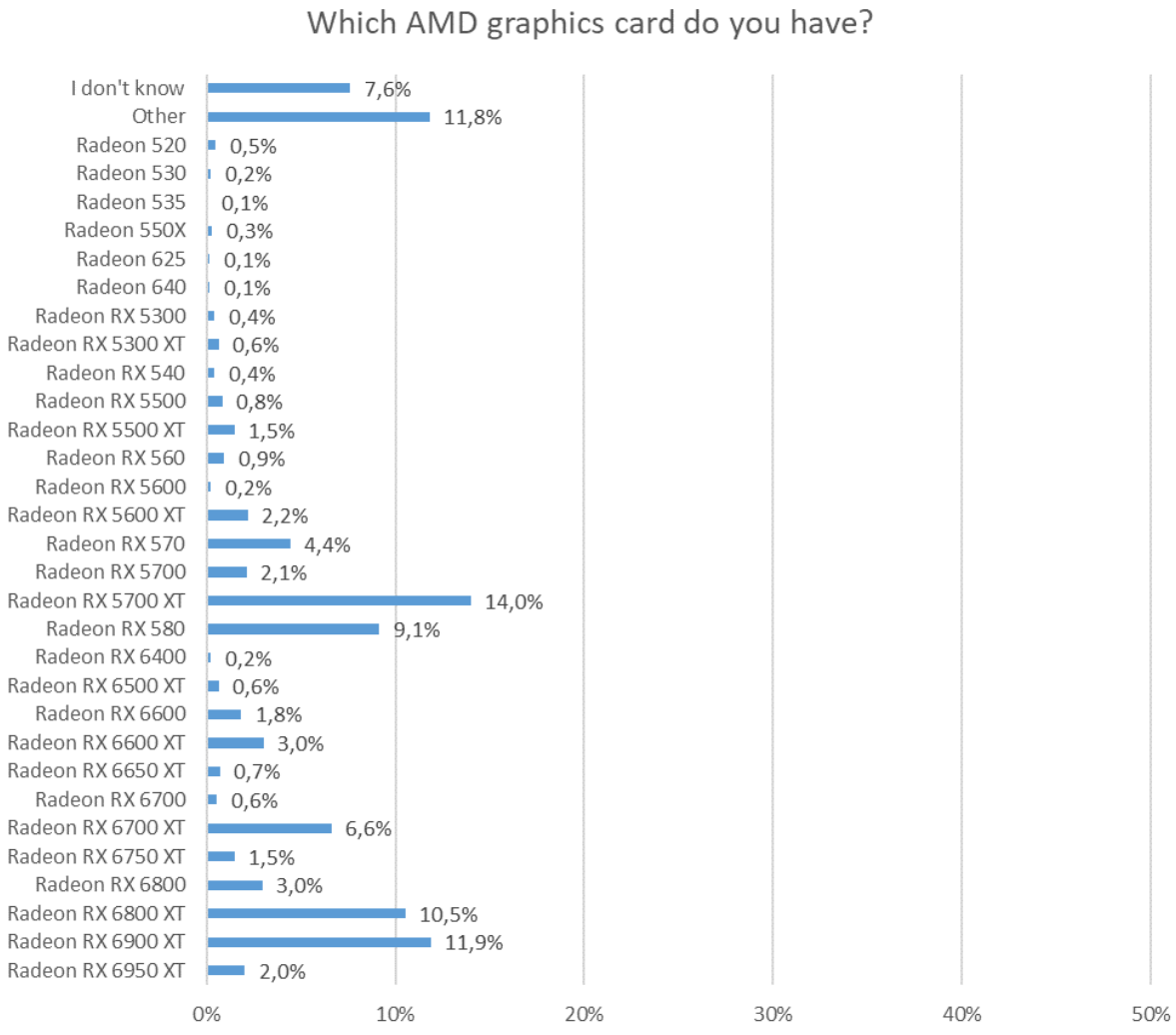
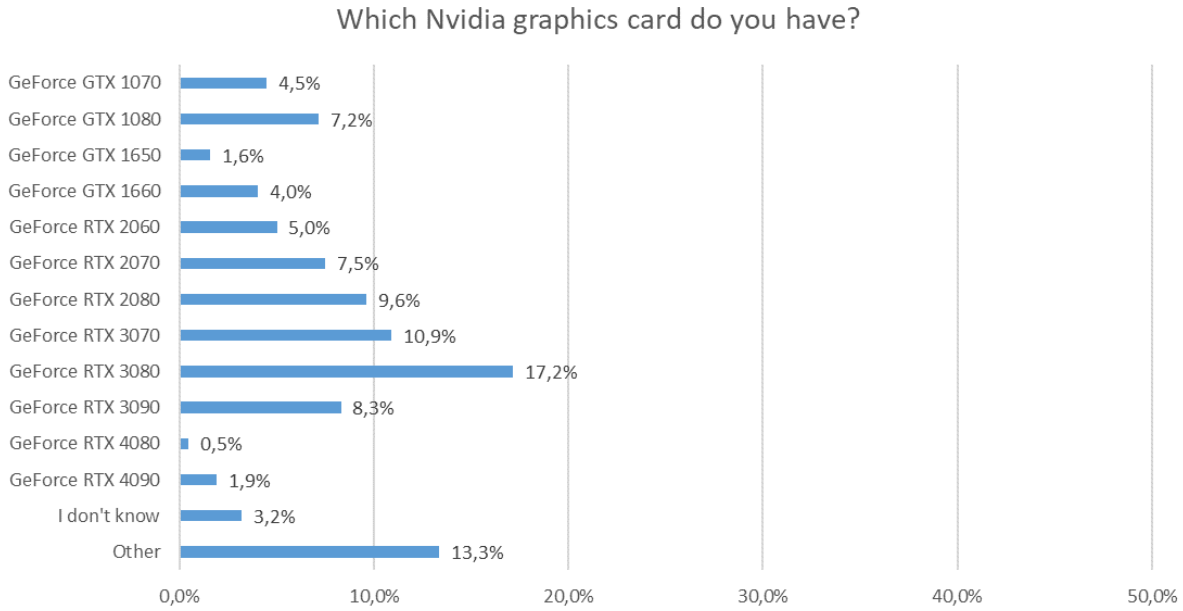
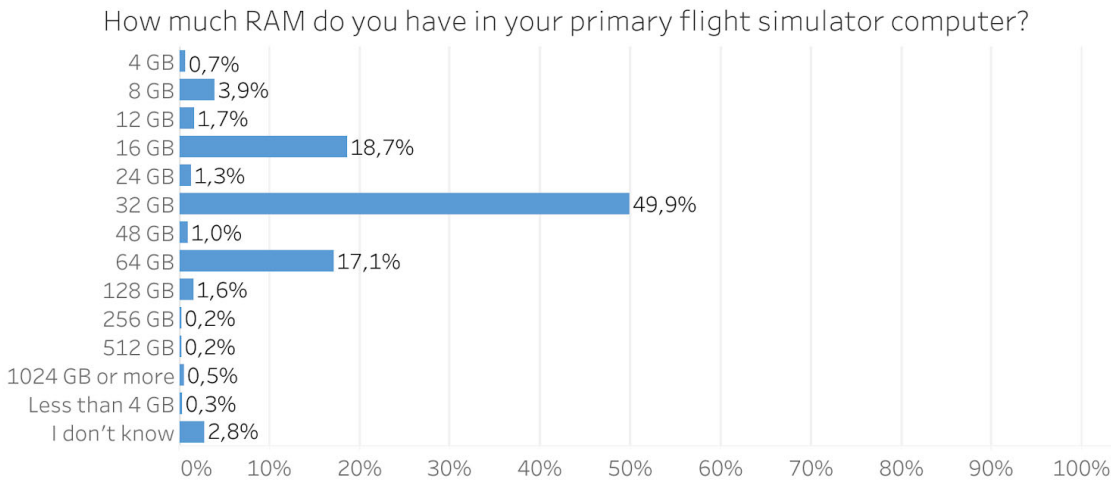






3.5.6. RAM

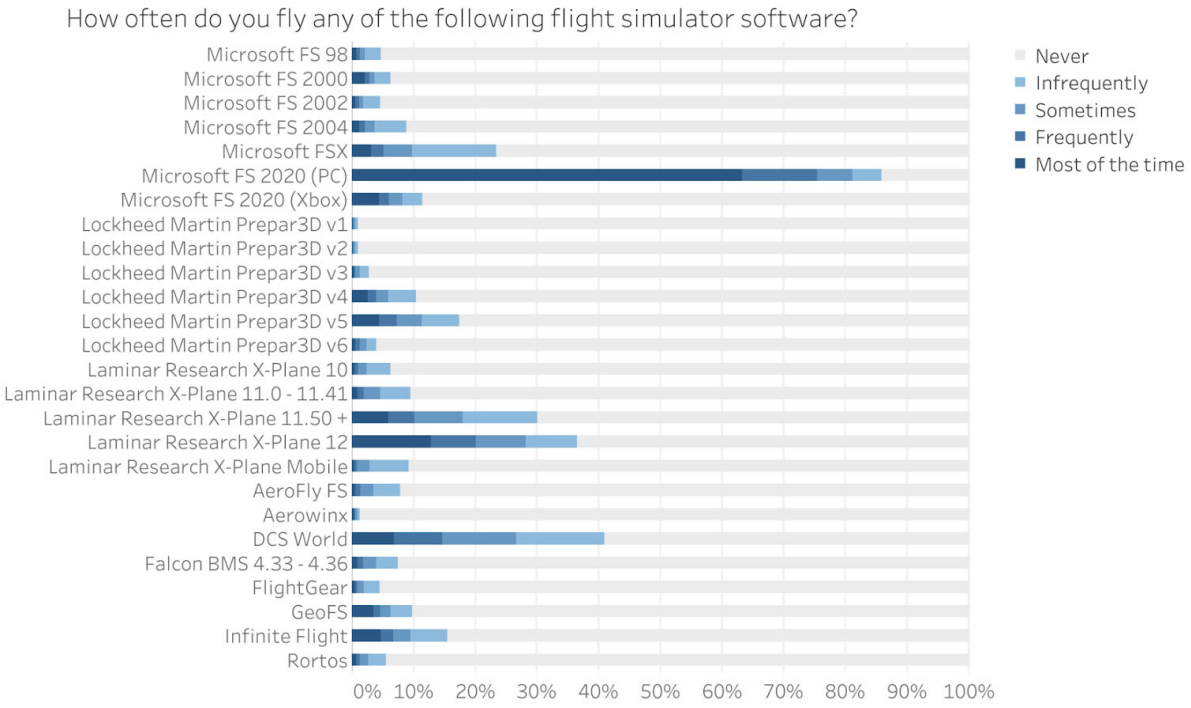
It's no secret that flight simulators are demanding when it comes to RAM. The survey suggests that half of those who responded to this question have 32 GB RAM in their primary flight simulator computer. An insight that reflects the recognition among users of the necessity for substantial RAM capacity to meet the performance requirements of modern flight simulation platforms.



3.6. Software Setup

3.6.1. Simulator Preference

This survey question stands out as the most engaging and frequently scrutinized. Participants are prompted to rate the frequency of their usage across various flight simulator software. Similar to the previous year, a distinct pattern emerges with the majority of respondents favoring Microsoft Flight Simulator. Additionally, flight simulators such as X-Plane from Laminar Research, Lockheed Martin Prepar3D, DCS World and Infinite Flight also maintain popularity among survey participants.



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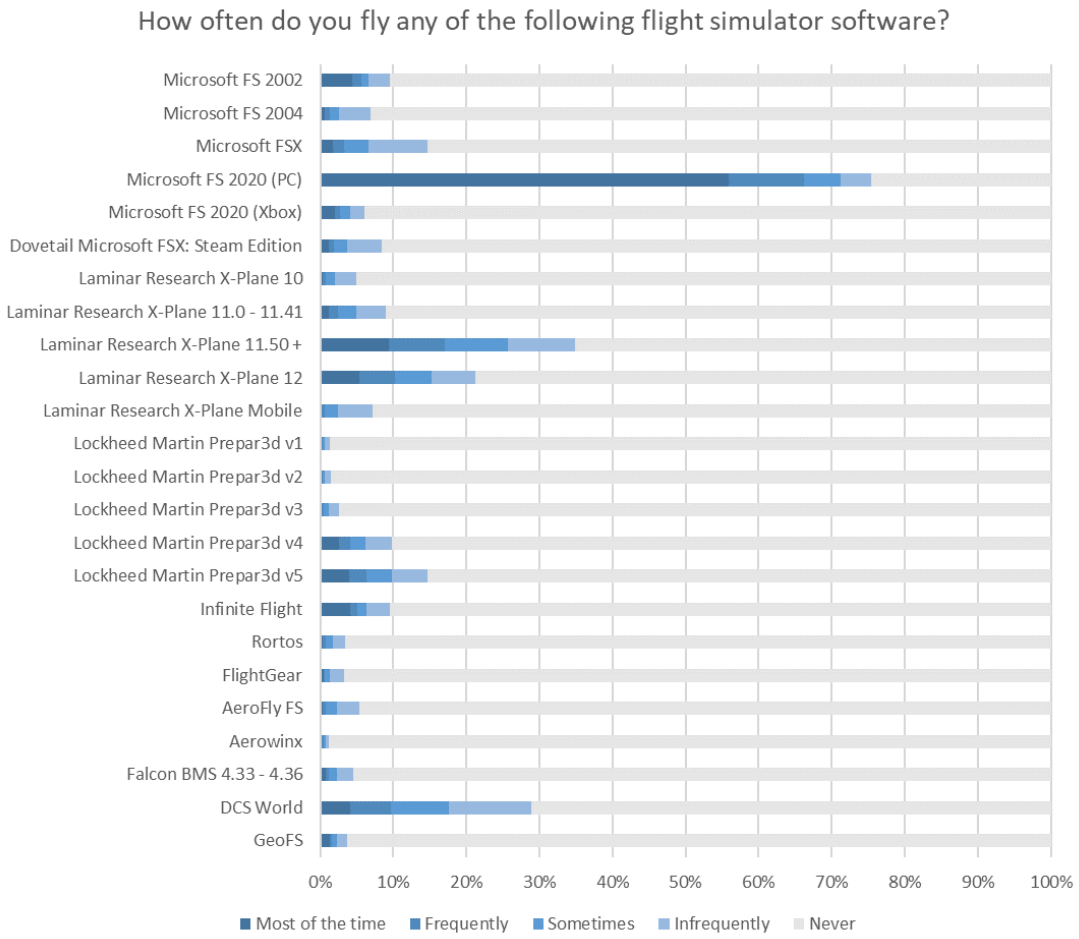
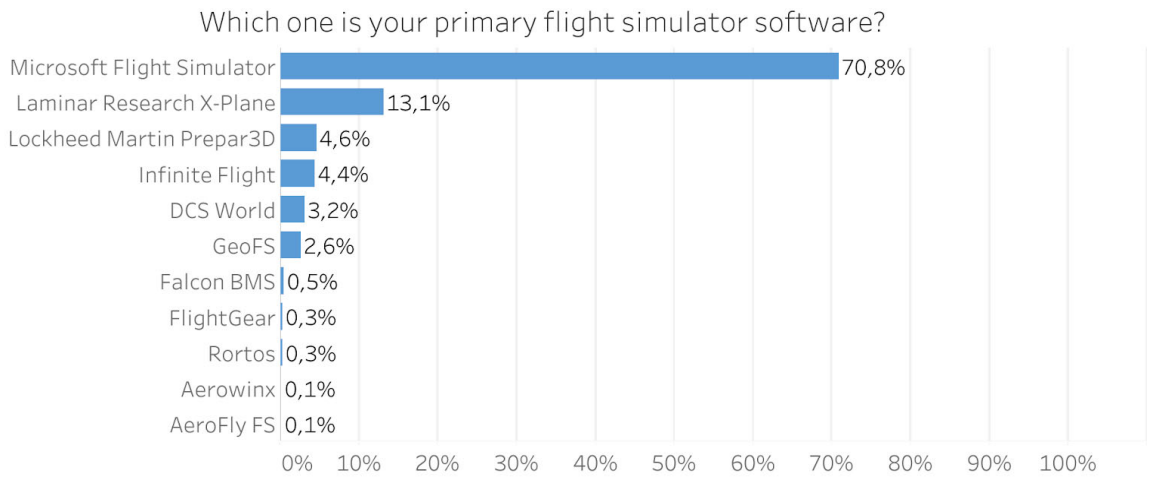


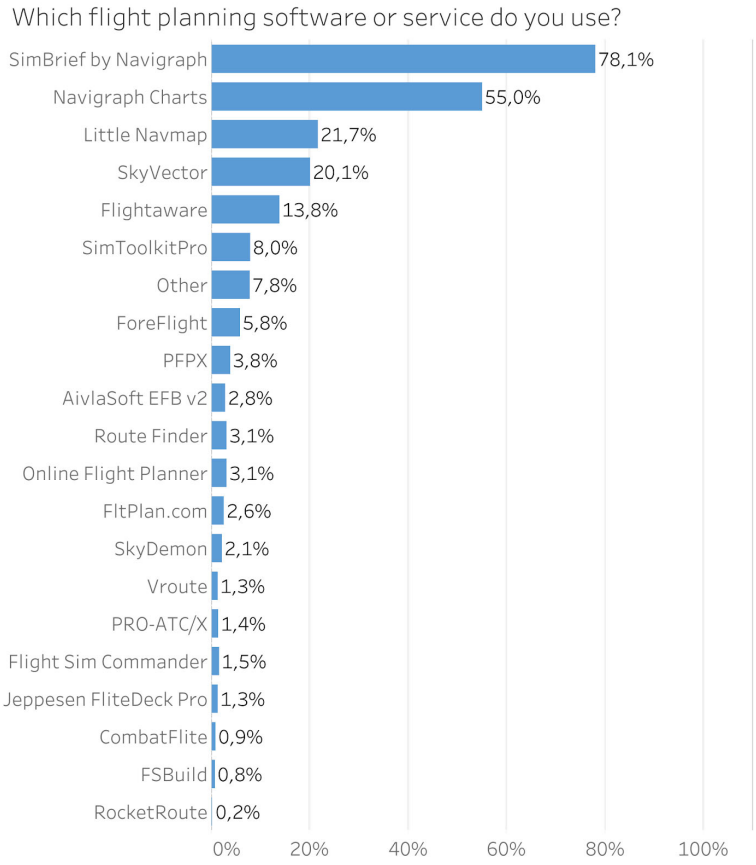
3.6.2. Primary Flight Simulator

This question was used to filter out respondents to make the upcoming simulator-specific questions more relevant to them. Microsoft Flight Simulator is the most popular simulator platform, being used primarily by over 70% of the respondents.



3.6.3. Flight Planning

Simbrief by Navigraph maintains its status as the preferred flight planning software among the respondents, consistent with the trend of the past five years. This year, its usage has risen from 72.6% to 81.2%. Navigraph Charts has also experienced an increase, growing from 42.6% to 57.1%, while Little Navmap has seen a rise from 19.5% to 22.5%.



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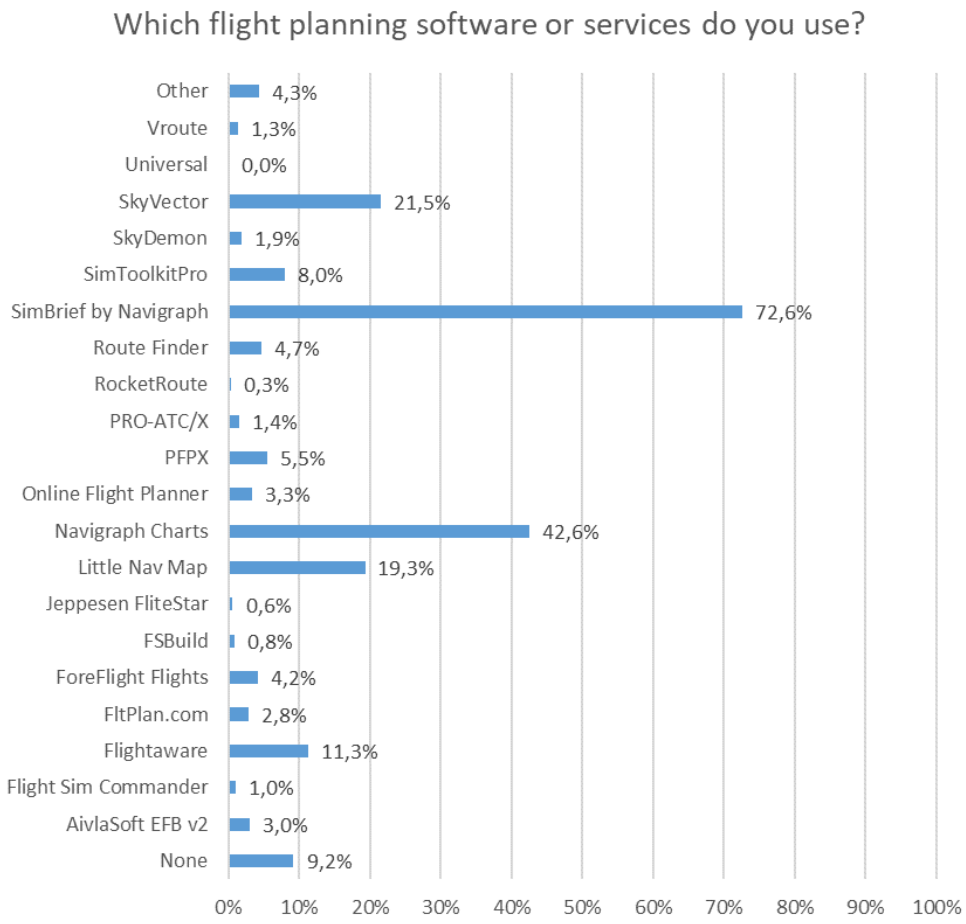
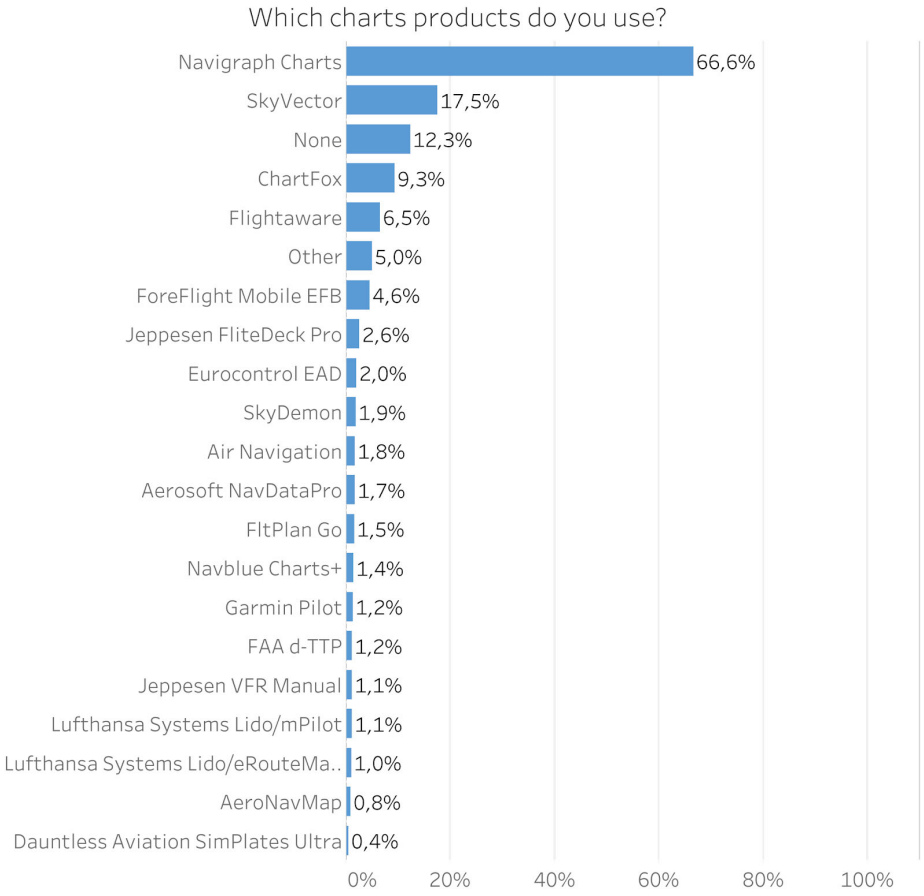


3.6.4. Charts Products

Consistent with the findings from the previous year, Navigraph Charts and SkyVector continue to hold the top positions as the most utilized charts products among the respondents.



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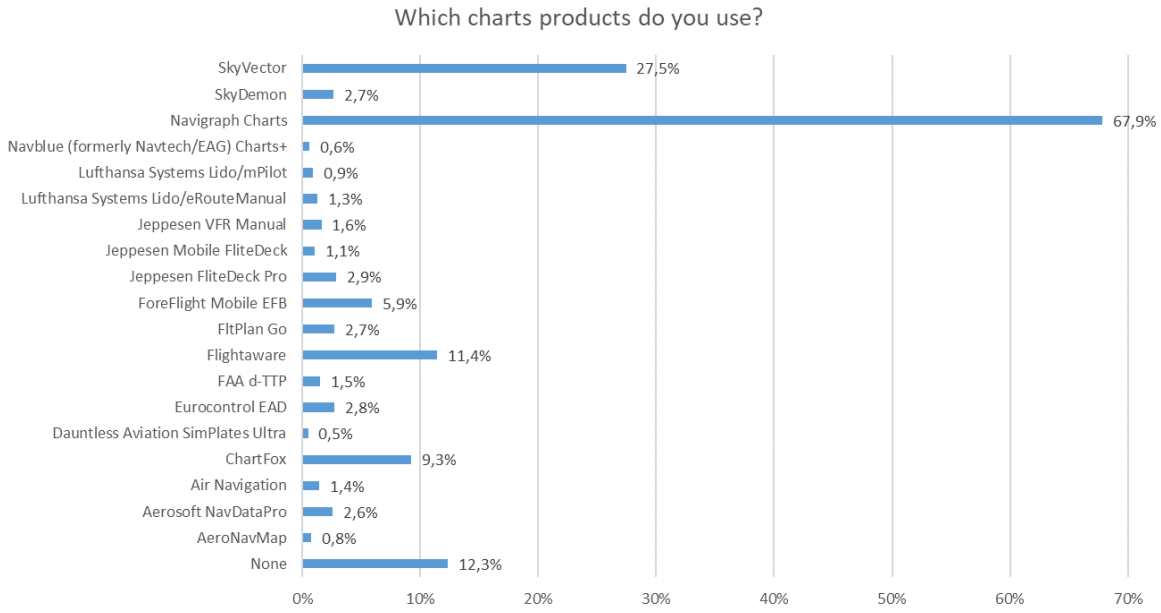
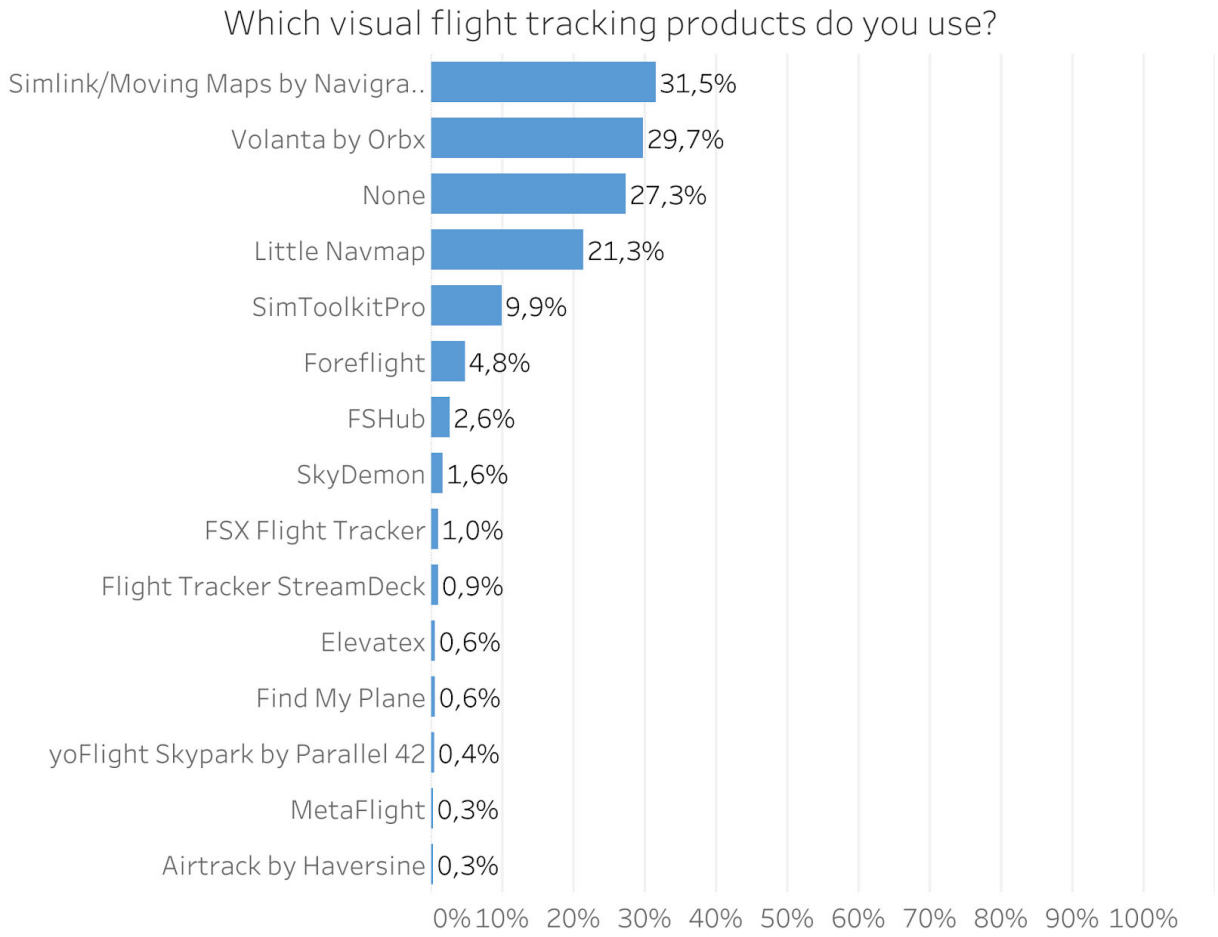


3.6.5. Visual Flight Tracking

The results are consistent with last year's survey results. Moving Maps retains its leading position, followed by Volanta by Orbx in second place, and Little Navmap securing the third spot.



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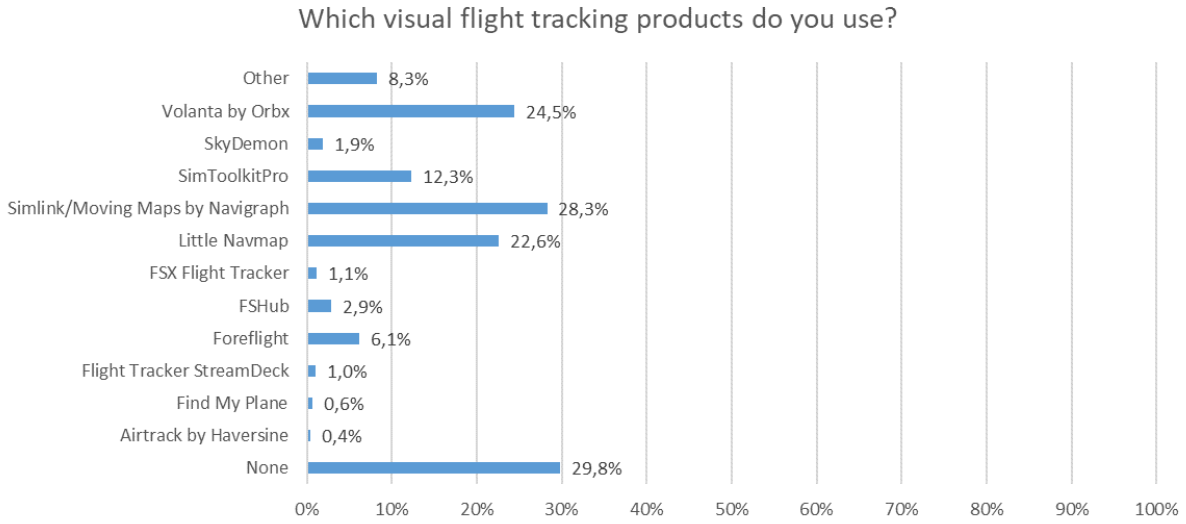
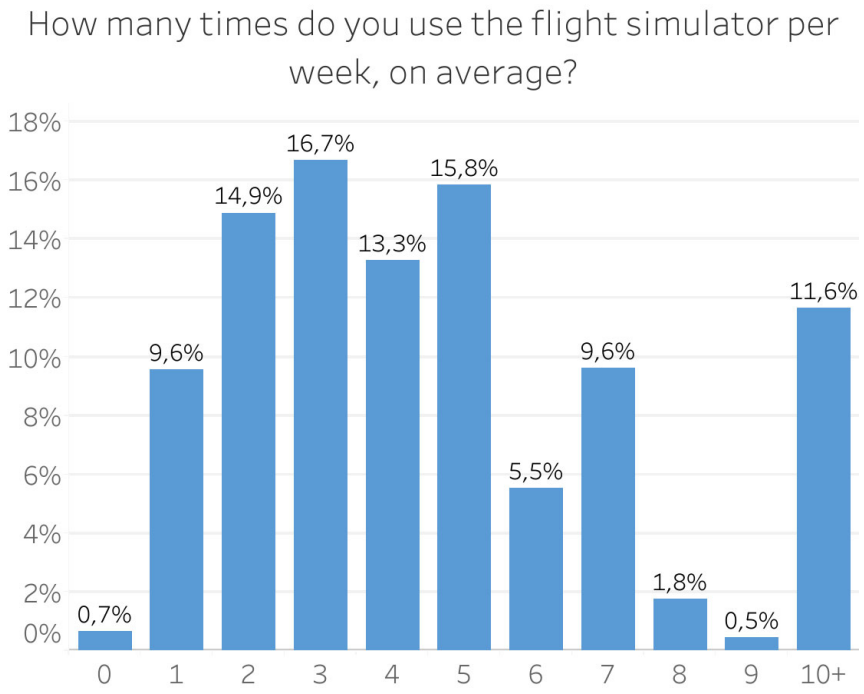


3.7. Simulator Habits

3.7.1. Usage - Times per Week

The following question was introduced in 2018 and has been included in subsequent surveys. Just like the previous year's survey shows, we find that it is most common to fly 2-5 times a week, aligning with trends observed in surveys conducted before last year.



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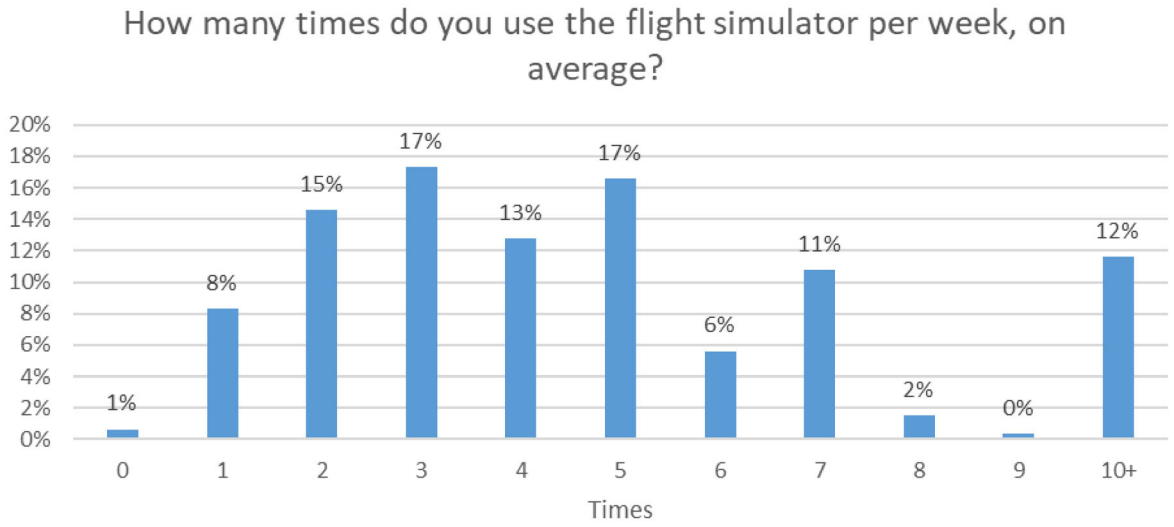
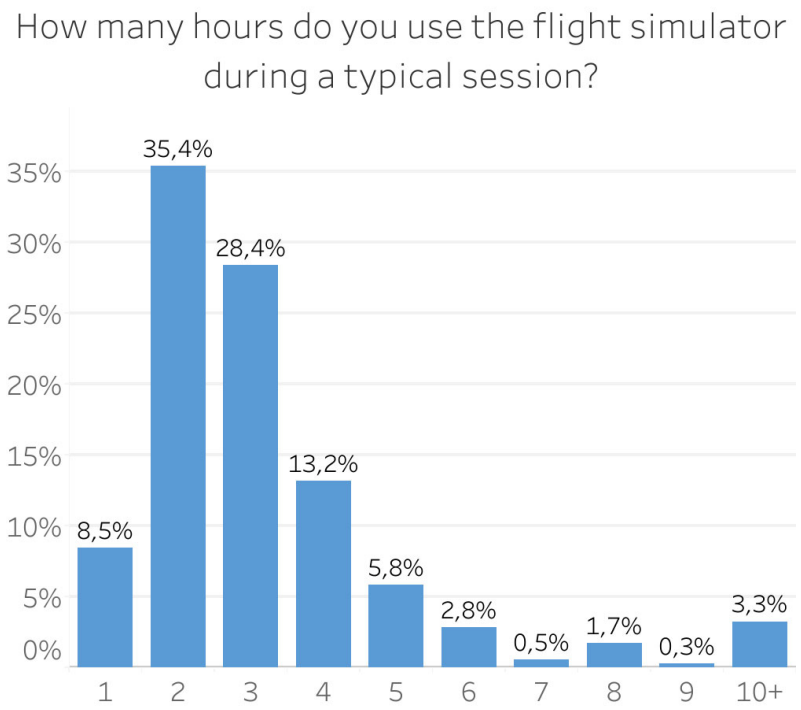
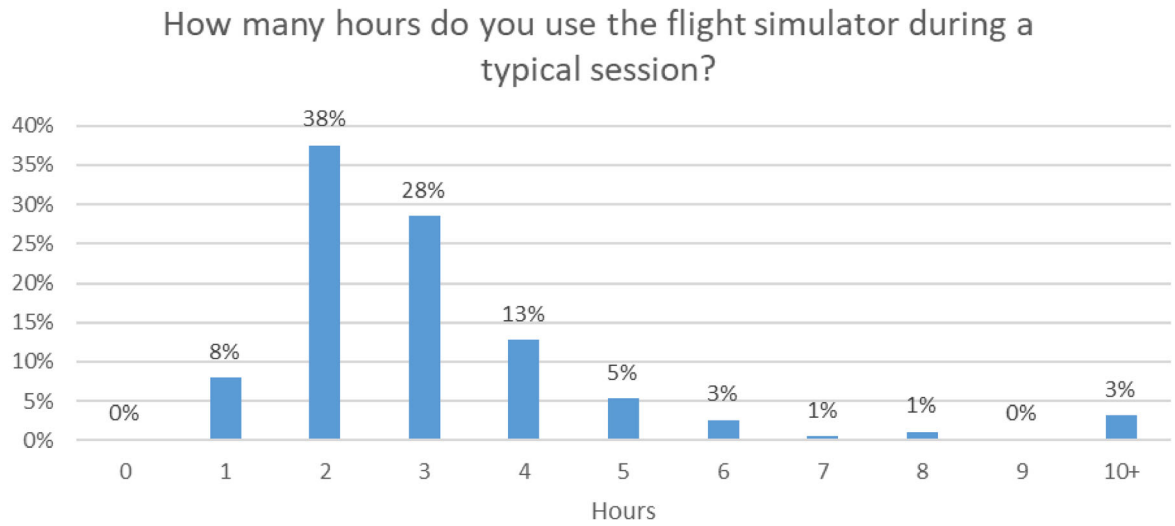


3.7.2. Usage - Hours per Session

The following question was asked for the first time in 2021. The results suggest that the habit of flying from 1-4 hours continues, as the results are comparable to the results in the 2021 and 2022 surveys.

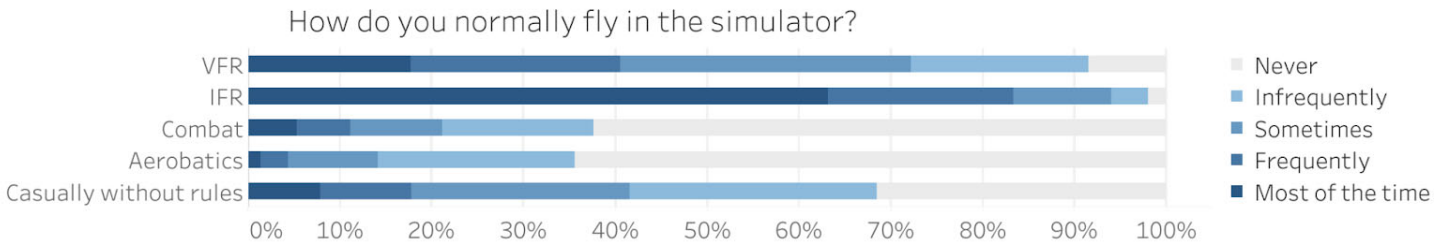


Last year's result:



3.7.3. Flight Rules

The Likert graph below depicting respondent's preferences in terms of how they typically fly in the simulator offers insightful patterns. Notably, Instrument Flight Rules (IFR) commands a prominent position, with 64% indicating that they engage in IFR flying "Most of the time" This robust preference for IFR scenarios is further underscored by the minimal 3% reporting "Never" opting for IFR experiences. Importantly, a comparative glance at last year's results reveals a notable increase in the preference for IFR "Most of the time" with the figure climbing from 53% to its current standing. Additionally, Visual Flight Rules (VFR) has seen an uptick, increasing from 15% to 19% "Most of the time". Although we are seeing a positive trend for both simulations over the past year, it is clear there is a growing inclination towards structured and rule-based flight simulations from the respondents.



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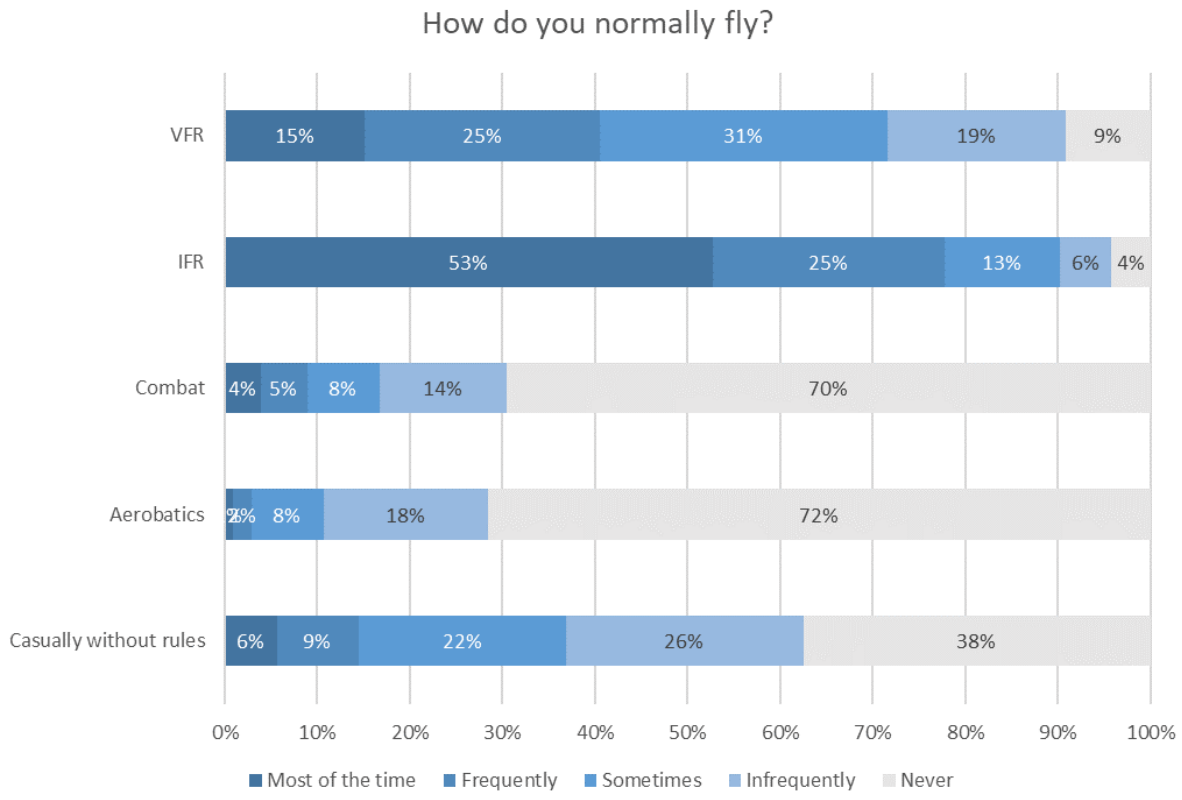
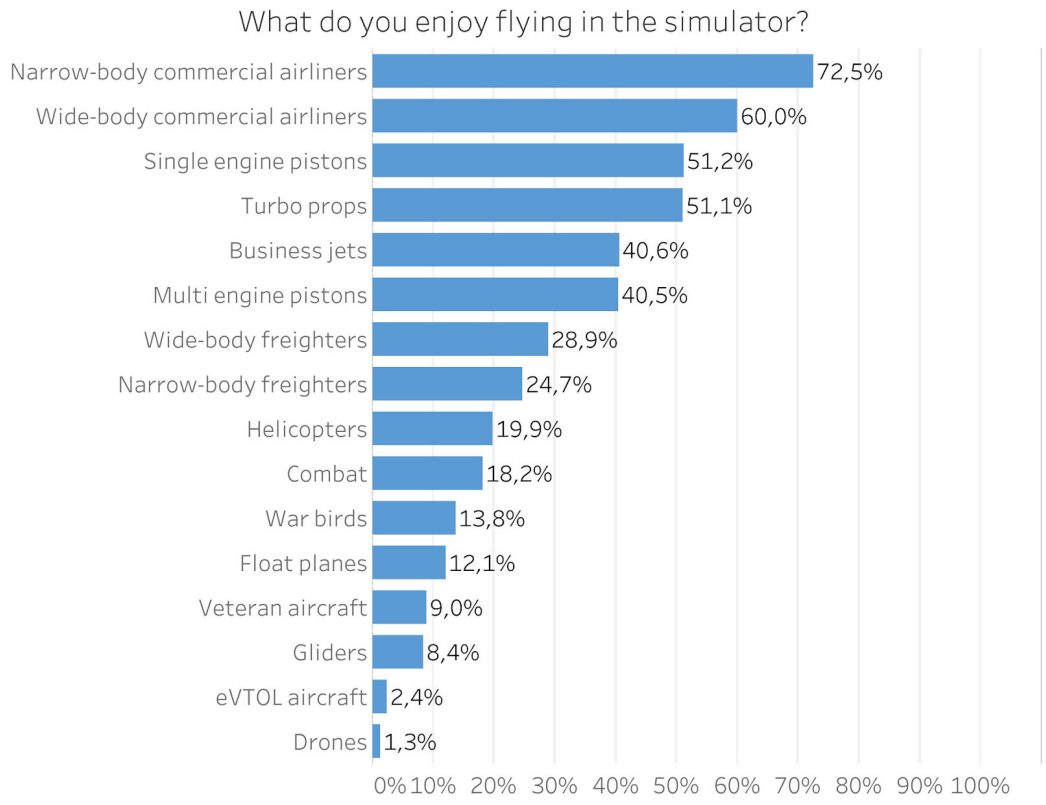


3.7.4. Aircraft Types

The wording of the question has been modified and simplified this year, making direct comparisons between the results of the two years inappropriate. The 2023 results suggest that narrow-body commercial airliners are the most popular to fly, followed by wide-body commercial airliners, single engine pistons, and turboprops.



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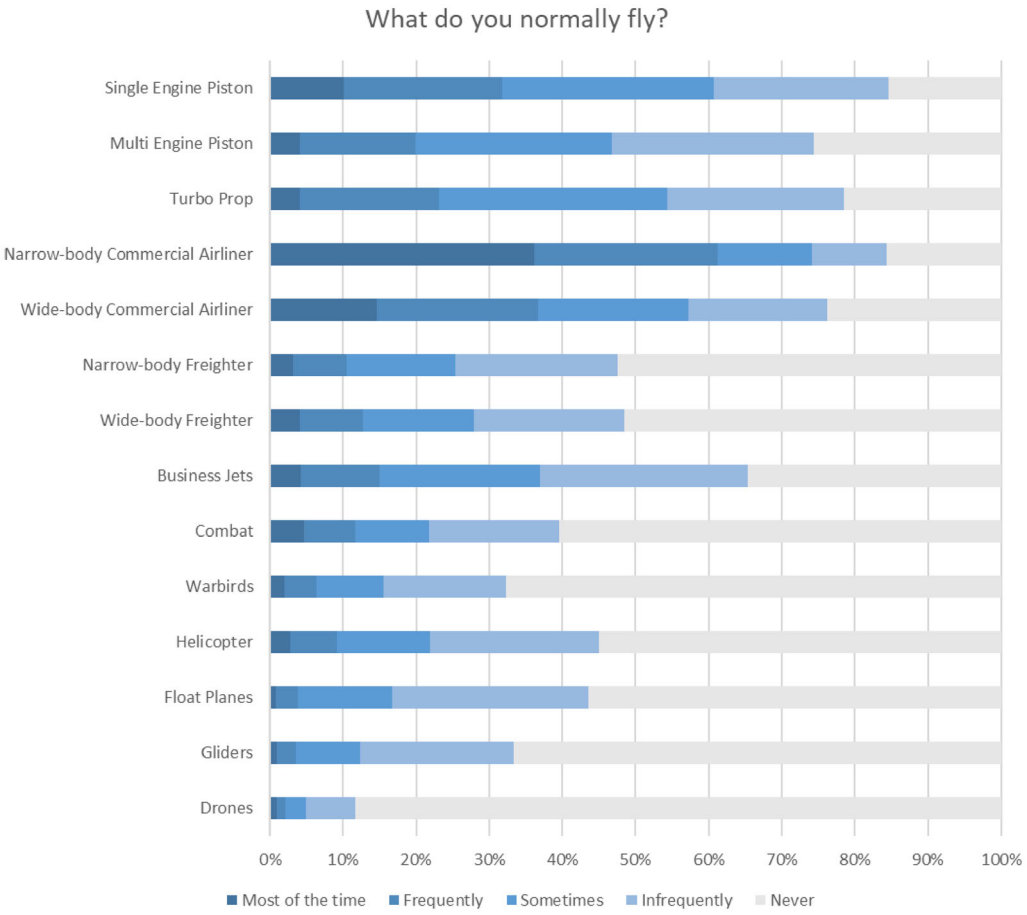
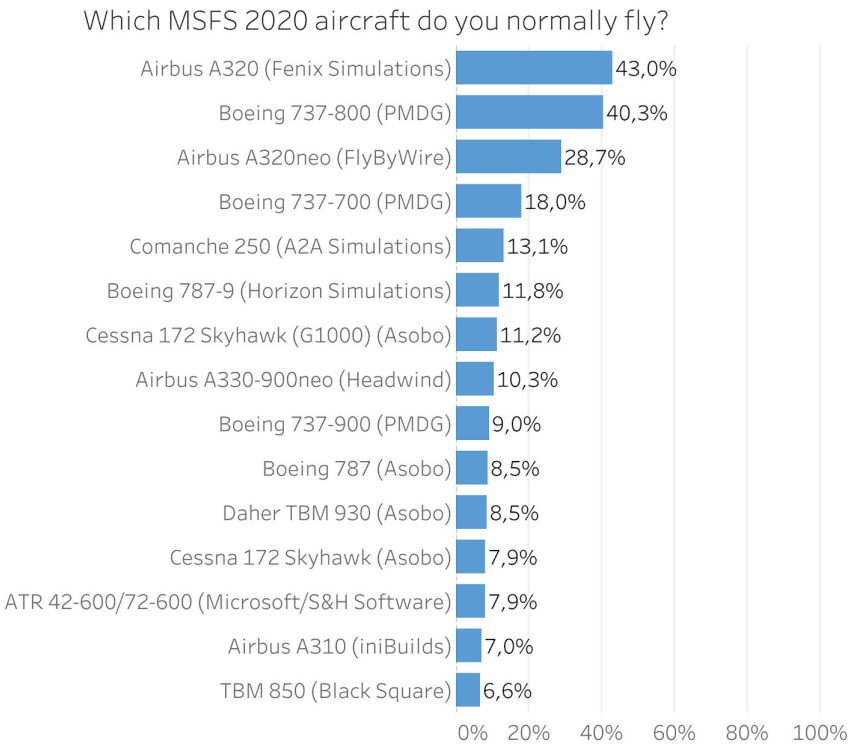


3.7.5. MSFS Aircraft Addons

This question was designed to gain insights into the preferred aircraft with Microsoft Flight Simulator (MSFS) among respondents. The graph below presents the top 15 aircraft choices by the participants. Leading the list is the Airbus A320 from Fenix Simulations, capturing 43.0% of respondents' preferences, with Boeing 737-800 from PMDG closely following at 40.3%.

The addon list presented to the respondents was graciously provided by msfsaddons.com.



3.7.6. X-Plane Aircraft Addons

In preparation for this survey we were not able to compile a complete list of X-Plane aircraft addons. Therefore we could not present a set of predetermined answering alternatives to the respondents, but had to provide the respondents with a free text field instead. However, despite extensive work with adjusting our AI algorithms, the answers provided by respondents in the free text response field were too varying and heterogeneous for us to be able to compile any conclusive results.

For next year we are sending out a request to the community to kindly provide us with a list of X-Plane aircraft addons which we can use in the survey.

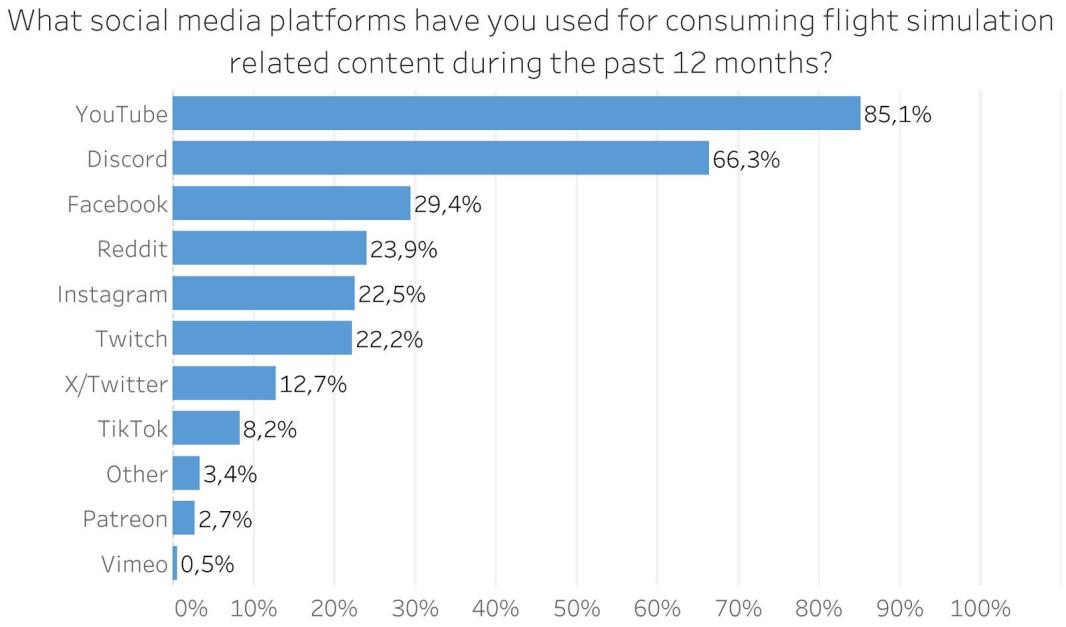
3.7.7. Prepar3D Aircraft Addons

We were not able to compile any results for this question due to the same reason as mentioned in the question above.

3.8. Media

3.8.1. Social Media

This question underwent simplification and rephrasing transitioning from“Which social media platforms do you use for consuming flight simulation-related content” to “What social media platforms have you used for consuming flight simulation-related content during the past 12 months”. While direct comparisons with the previous year’s survey are not feasible due to the change in wording, the 2023 results indicate that YouTube continues to maintain its status as the most popular social platform among respondents, with an 86.1% usage rate. Discord follows closely behind at 67.1%, solidifying its position as a significant platform for flight simulation-related content consumption within the community.



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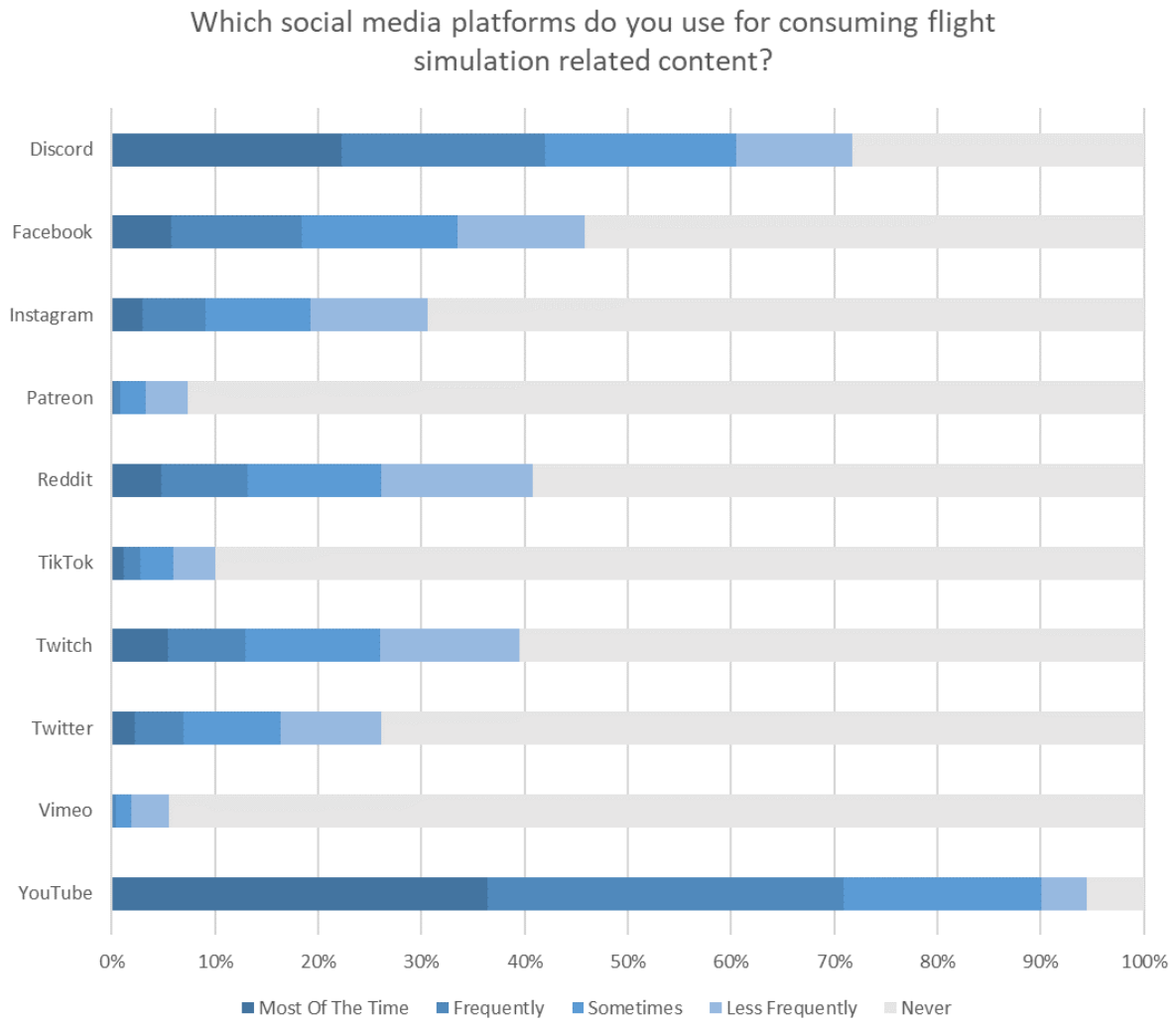
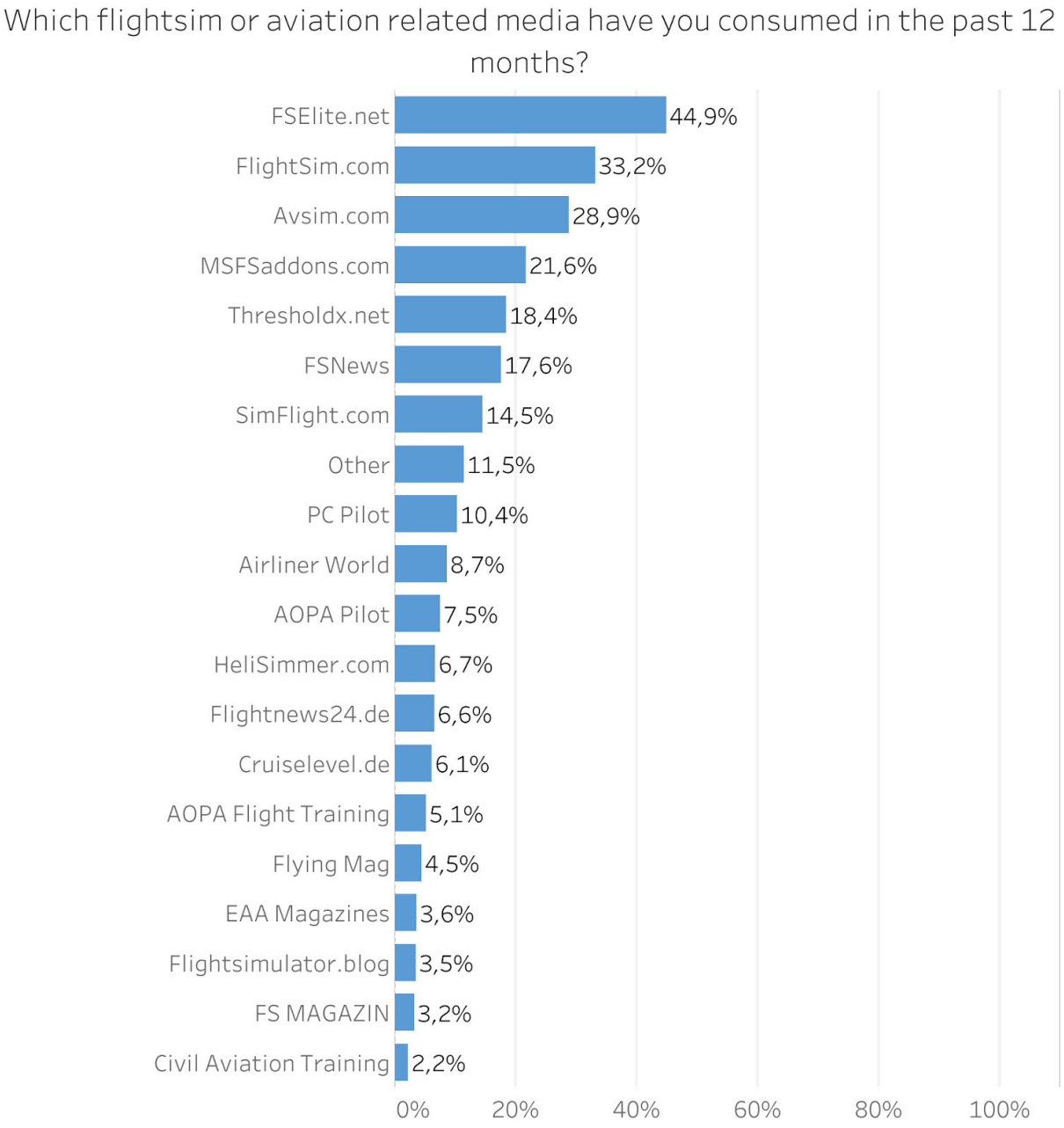


3.8.2. Media Consumption

Just like the previous question about social media, the question has been simplified and rephrased to cover what aviation related media the respondents have consumed in the past 12 months. FSElite emerges as the most popular media source among participants, with a substantial 48.4% indicating its consumption. FlightSim.com follows closely at 35.8%, and Avsim.com secures the third position at 31.1%. While direct comparisons with the 2022 survey are not feasible due to the adjusted wording, noteworthy consistency is observed as the top three media preferences persist across both years.



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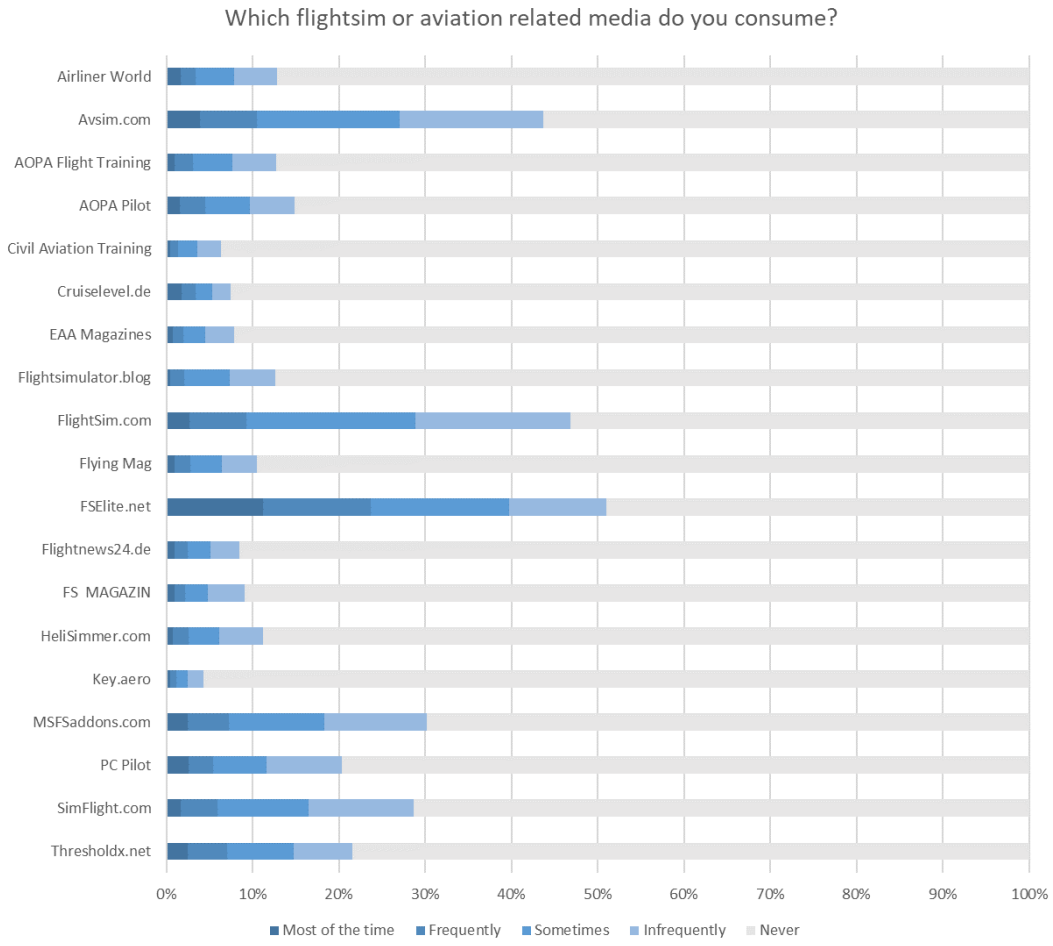
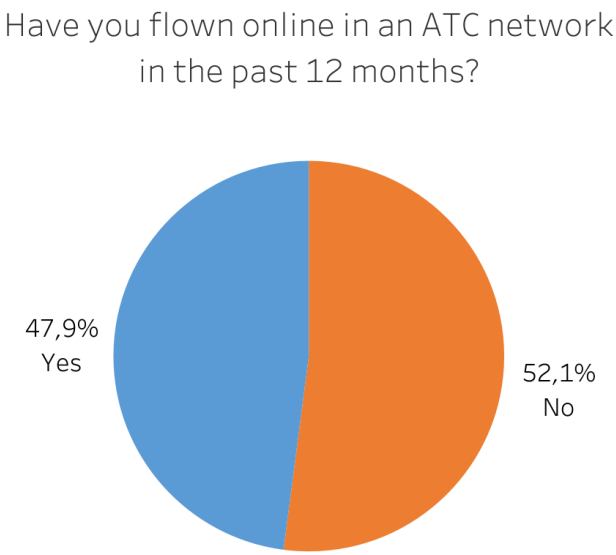


3.9. Online ATC Networks

3.9.1. Participation

In this year's survey, we decided to further specify the question about flying online by including "ATC". As a result, direct comparisons with last year's results may not be applicable. The findings reveal that approximately half of the respondents have engaged in online flying within an Air Traffic Control (ATC) network over the past 12 months. This adjustment in questioning aims to provide more nuanced insights into the respondents' online flying experiences, particularly in the context of ATC networks.



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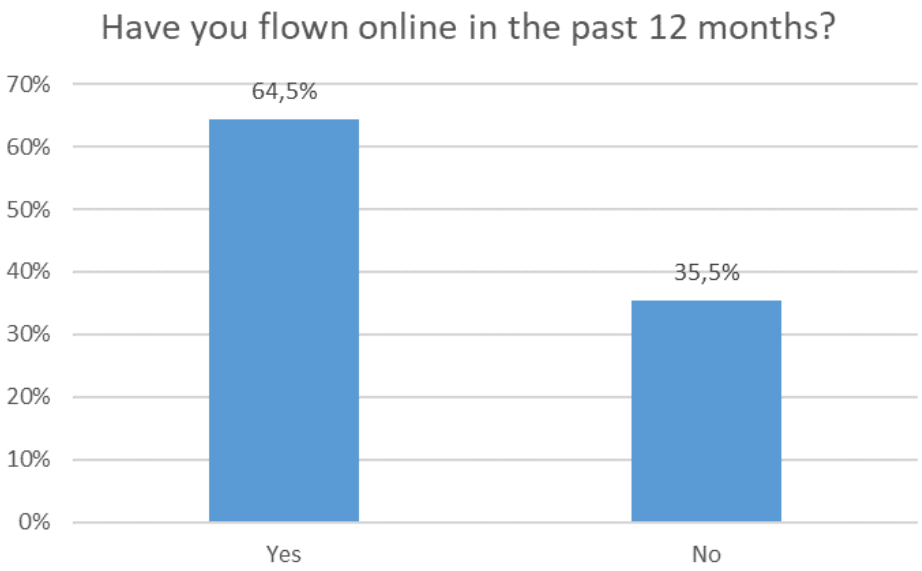
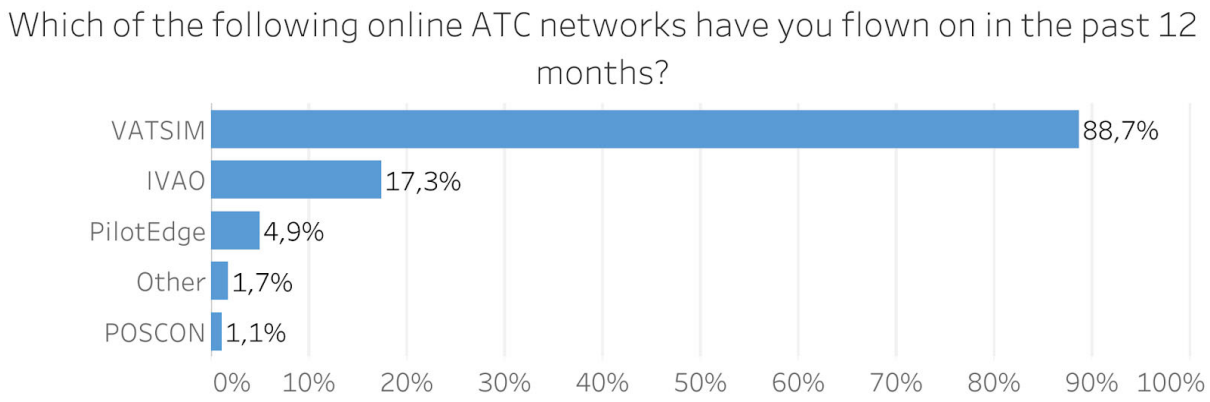


3.9.2. ATC Networks

Continuing from the preceding question, this follow-up inquiry was directed to those who affirmed their participation in flying on ATC networks. Similar to the earlier question, we chose to enhance the specificity of this inquiry by incorporating “ATC” into its framing. Among the respondents who partake in online flying with ATC, the majority have actively flown on VATSIM in the past 12 months, securing the top position. IVAO and Pilotedge follow closely, claiming the 2nd and 3rd spots, respectively.



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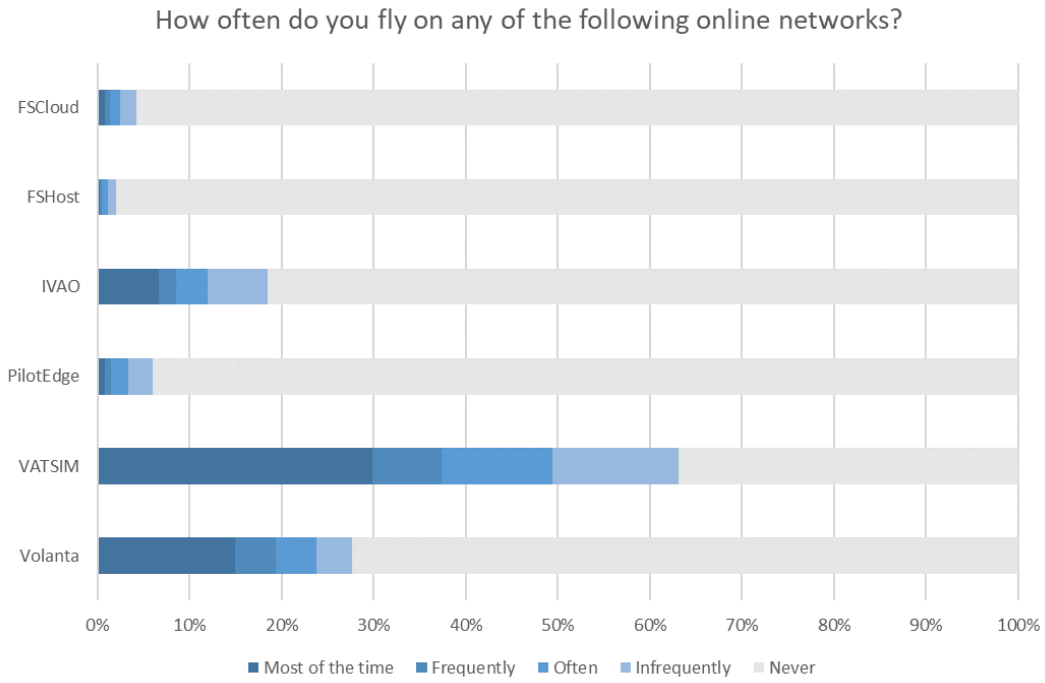
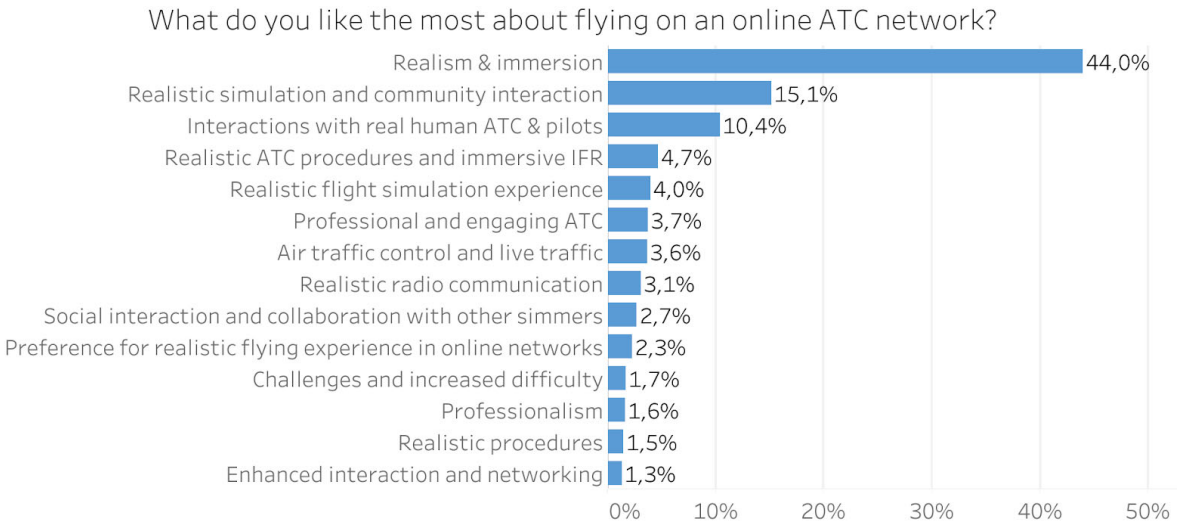


3.9.3. ATC Network Feedback

Within this section, we examine the valuable insights garnered from Feedback about the ATC Network, focusing on the responses to the pivotal questions: what do you like most and least about flying on an online ATC network. The first graph accentuates the positive aspects, revealing that the community highly values “Realism & immersion” and “Real Human ATC & Pilots.” Simultaneously, the second graph explores the challenges faced, with top concerns including “Trolling/Unhelpful Behaviour/Inexperienced Pilots'' and “Coverage & Availability.” Supported by AI-generated analysis, this section aims to offer nuanced insights into the dynamics shaping the online ATC Network experiences of flight simulation enthusiasts and provides a foundation for informed considerations in the ongoing development of these networks.



Enthusiasts of flying simulators in online networks greatly appreciate the opportunity to fly with others, including friends, teammates, and fellow aviation enthusiasts. This aspect not only fosters a sense of community but also significantly enhances the immersive nature of the simulation. Engaging in group flights, adhering to formal procedures, and receiving guidance from air traffic controllers transforms the experience into something far more interactive and enjoyable, with the additional perk of exploring new places in a realistic setting.

A significant number of users value the enhanced immersion and realism provided by flying simulators within online networks. The presence of human air traffic controllers and the near-accurate replication of real-world communication are particularly noted for augmenting the immersive quality of the simulation. Furthermore, the sense of belonging to a community and the challenges posed by online networks are also significant contributors to this immersive experience. The meticulous replication of real-world environments, operations, and communications, coupled with training opportunities, significantly adds to the authenticity. Moreover, the sense of belonging to a community and the unique

challenges posed by interacting with human air traffic controllers play a vital role in enhancing this realism.

For many users, interacting and communicating with other players and air traffic controllers is a highly enjoyable aspect of flying simulators in online networks. These interactions, which include conversations, messages, and dynamic events, bring a level of activity and informative exchange that is highly appreciated. Furthermore, the animations and feedback that accompany these interactions significantly enrich the overall experience.

Participants in online networks greatly value their role in augmenting the realism and immersion of flight simulation. By simulating real-world flying conditions and adding much-needed realism, these networks make the flight experience feel more authentic and lively. The interaction with human air traffic controllers and other pilots enhances the sense of community and introduces additional complexity and challenges, which in turn contribute to a deeper understanding of aviation procedures and a stronger connection with the global community of flight simulators.

The opportunity to engage with air traffic controllers and fellow pilots stands out as a highly valued aspect. This interaction, encompassing communication with ATC, adherence to ATC rules, and collaborative flying with others on the network, creates a dynamic and highly immersive experience. Pilots value the chance to practice real-life procedures, coordinate with other aircraft, and communicate in real-time with fellow simmers, adding both realism and challenge to their flying experience.

Real-time communication and interaction with human air traffic controllers are highly favored by some users of flying simulators in online networks. This facet of the simulation offers an authentic and realistic experience, enabling real-life-like interactions and the use of genuine phraseology. The addition of human elements not only increases realism but also fosters a live, interactive environment.

Several users of flying simulators in online networks cite immersion as a significant highlight. These respondents express their enjoyment of the deeply immersive experience that flying in a simulated environment offers. This is complemented by the sense of community and the opportunities available for skill learning and practice.

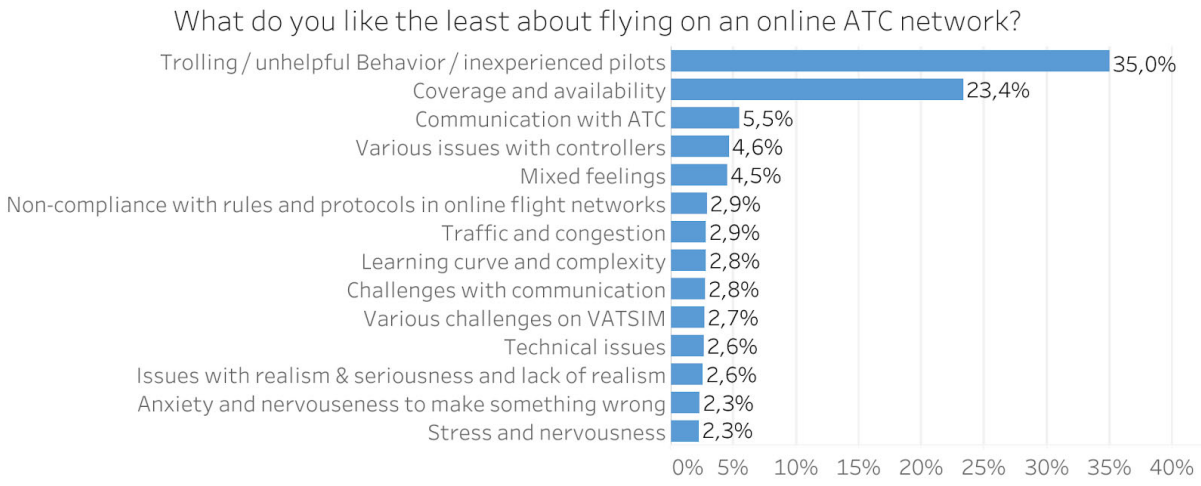
For a number of respondents, the ability to follow and simulate real-world procedures is an important draw to flying their simulator in online networks. This aspect provides a complexity and depth to the experience that is greatly appreciated. It emphasizes the importance of adhering to regulations and instructions from air traffic controllers, underlining the focus on procedures and the sense of community that characterizes the online flying experience.

A distinct aspect of flying in online networks with simulators, for some users, is the superior quality of air traffic control (ATC) services compared to the default ATC in standalone simulators. Many users value the professionalism and expertise of human ATC controllers, as well as the opportunity to refine their own ATC skills. The sense of community and the interaction with real people, as opposed to AI ATC, are also key factors in the enhanced experience provided by online ATC networks.

For several respondents, the sense of community is a particularly enjoyable aspect of flying simulators in online networks. These respondents emphasize the importance of this community, noting it as a primary reason for their engagement in online networks. This community aspect not only provides shared experiences and warmth but also opportunities for social interactions, friendships, and organized events.

Some respondents express that flying on online ATC networks significantly enhances the realism and immersion of their simulator experience. They value the realistic interactions with ATC, the opportunity to communicate with real people, and the ability to practice real-world scenarios and improve their ATC communication skills. The added realism, authenticity, and sense of community provided by live controllers and the presence of other aircraft in the airspace are key factors in their enjoyment of online ATC networks.

Practicing and improving radio communication skills is a particularly favored aspect for some users of flying simulators in online networks.



1. **Professionalism and Competence Concerns:**

   Influx of Non-Serious Pilots: The introduction of MSFS has led to an increase in participants who don't take the simulation seriously, negatively impacting overall professionalism.

   Experience Gap Issues: Newcomers often lack basic knowledge and understanding of flight simulation procedures, leading to disruptions. Conversely, experienced pilots sometimes exhibit impatience and disrespect towards these beginners.

   Trolling and Disruptive Behavior: A fraction of users engage in trolling, disruptive, or childish behavior, significantly detracting from the simulation's realism and enjoyment.

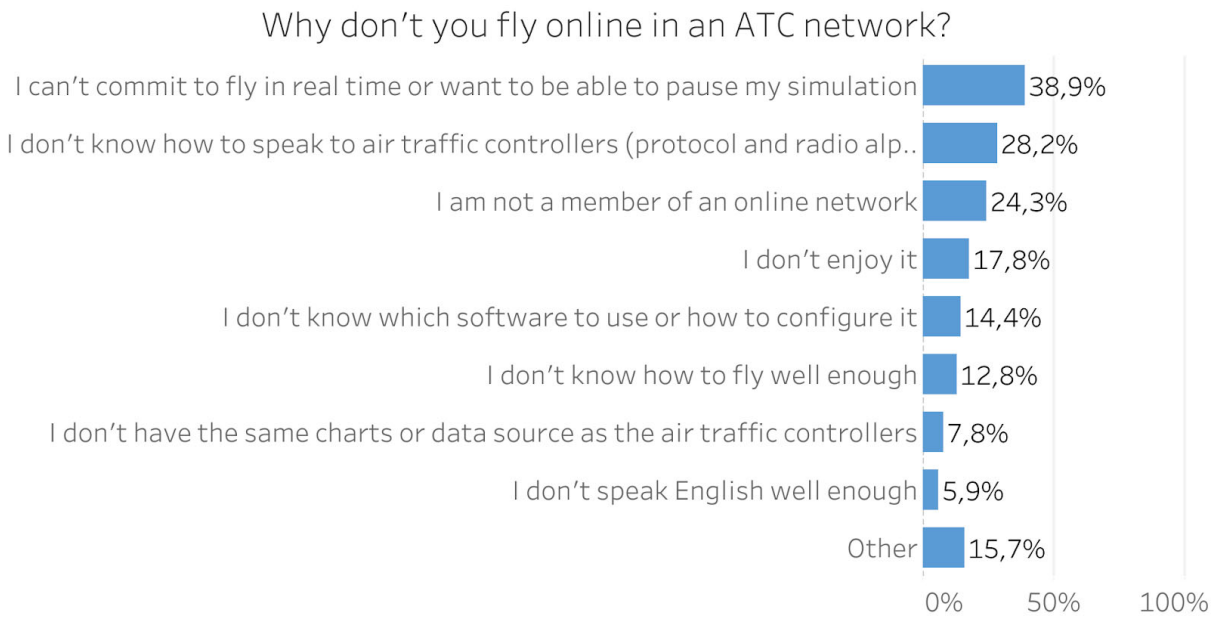
2. **ATC-Related Challenges**:
   - **Inconsistent ATC Coverage**: Pilots frequently encounter gaps in ATC coverage, especially in less popular regions or during off-peak times.
   - **Variability in ATC Quality**: The skill level and professionalism of ATC controllers vary greatly, with instances of unexpected log-offs, overwhelmed controllers, and rudeness.
3. **Technical and Integration Difficulties**:
   - **Technical Glitches and Performance Issues**: Connectivity problems, crashes, and lag are common, affecting the smooth running of simulations.
   - **Complex Setup and Integration**: The difficulty in setting up and troubleshooting the network, and challenges in integrating with platforms like MSFS, are sources of frustration.
4. **Communication Barriers and Challenges**:
   - **Phraseology and Language Barriers**: Adhering to correct phraseology is challenging, especially for beginners, and language barriers exacerbate these difficulties.
   - **Poor Audio Quality**: Issues with microphone setups and disruptive background noises hinder clear communication.
5. **Realism and Immersion Concerns**:
   - **Compromised Realism**: Non-realistic behavior by participants, along with procedural inaccuracies, diminish the immersive experience.
   - **Inconsistent Simulation Environments**: Discrepancies between simulator environments and real-world or controller instructions further affect realism.

6. **Operational and Structural Limitations**:
    - **VATSIM's Structure and Politics**: The top-down structure and internal politics within VATSIM are sources of dissatisfaction for some pilots.
    - **Limited Focus on VFR Operations**: The predominant focus on IFR-centric flying limits opportunities for VFR enthusiasts.
7. **Personal Stress and Time Constraints**:
    - **Pressure and Anxiety**: Pilots often feel stressed about communicating effectively, fearing criticism for mistakes.
    - **Time Commitment and Inflexibility**: The inability to pause flights and the need for constant attention, especially on long flights, can be taxing.
8. **Specific Operational Issues**:
    - **Challenges with Unicom**: Ineffective use of Unicom leads to confusion and a lack of coordination among pilots.
    - **Waiting Times and Delays**: Long queues for clearances and congested communications during busy events are common grievances.
    - **Lack of Training Resources**: The absence of comprehensive training for beginners, especially in areas like phraseology, is a noted gap.
9. **Interpersonal Dynamics**:
    - **Conflict and Misunderstandings**: The presence of inexperienced pilots and sometimes condescending behavior from more experienced participants leads to tensions.
    - **Elitism and Lack of Flexibility**: Some pilots exhibit elitist attitudes, showing little patience or understanding for newcomers or those less skilled.

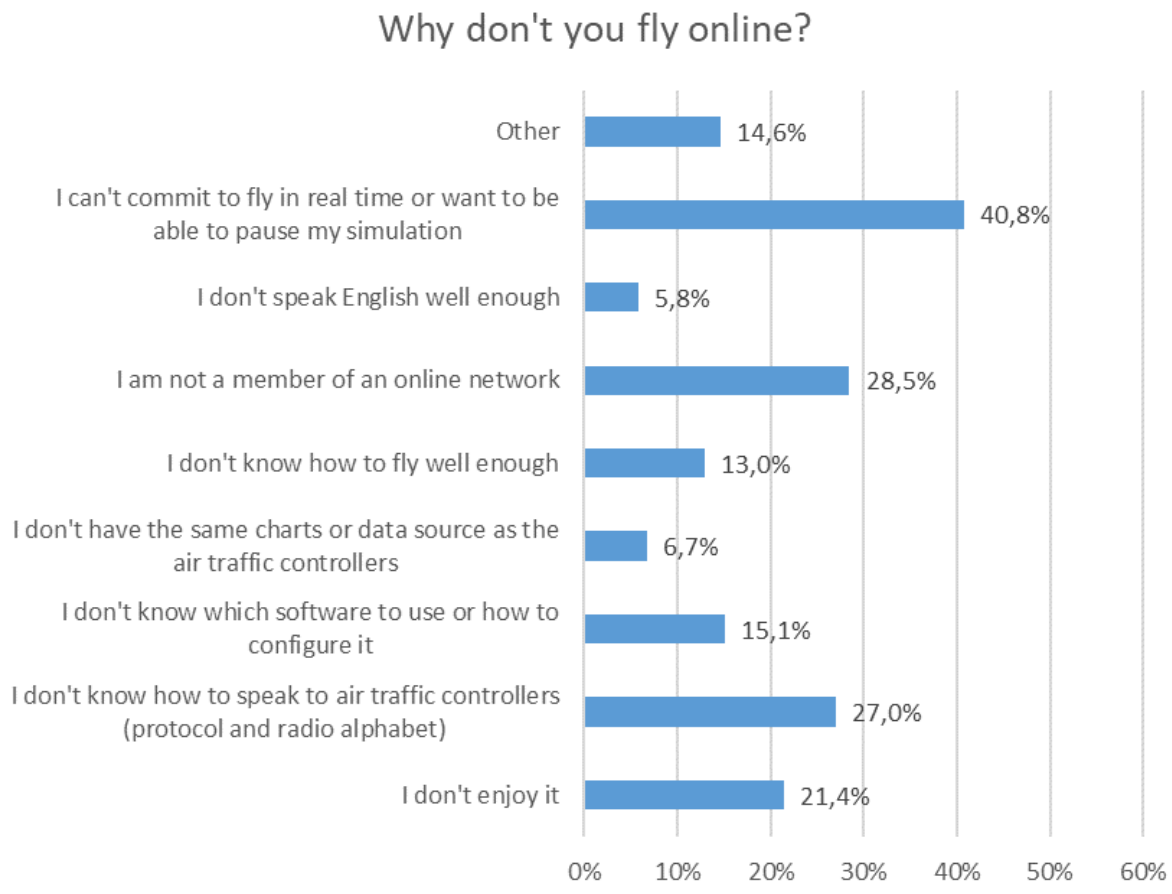
These challenges, while significant, are counterbalanced by the immersive and rewarding aspects of online flight simulation that continue to attract a dedicated user base. The detailed exploration of these issues can provide valuable insights for network administrators and developers, paving the way for improvements and enhanced user satisfaction.

3.9.4. ATC Networks - Why Not?

The following question is to gain insight into the reasons behind respondents choosing not to engage in online flying. The question was only presented to those who indicated that they did not partake in online flying during the past 12 months. Similar to the findings from the previous year, the most common reasons are “I can’t commit to flying in real time or want to be able to pause my simulator,” “I lack knowledge on how to communicate with air traffic controllers,” and “I am not a member of an online network.” These consistent responses highlight recurring themes among individuals who opt not to participate in online flying and provide valuable insights into the barriers or challenges they perceive in doing so.



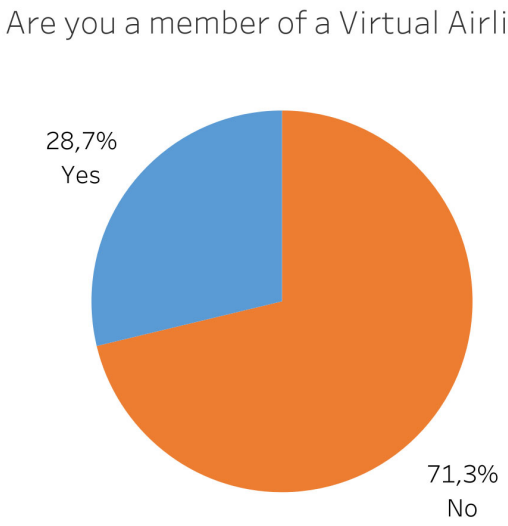
Last year’s result:



3.10. Virtual Airlines

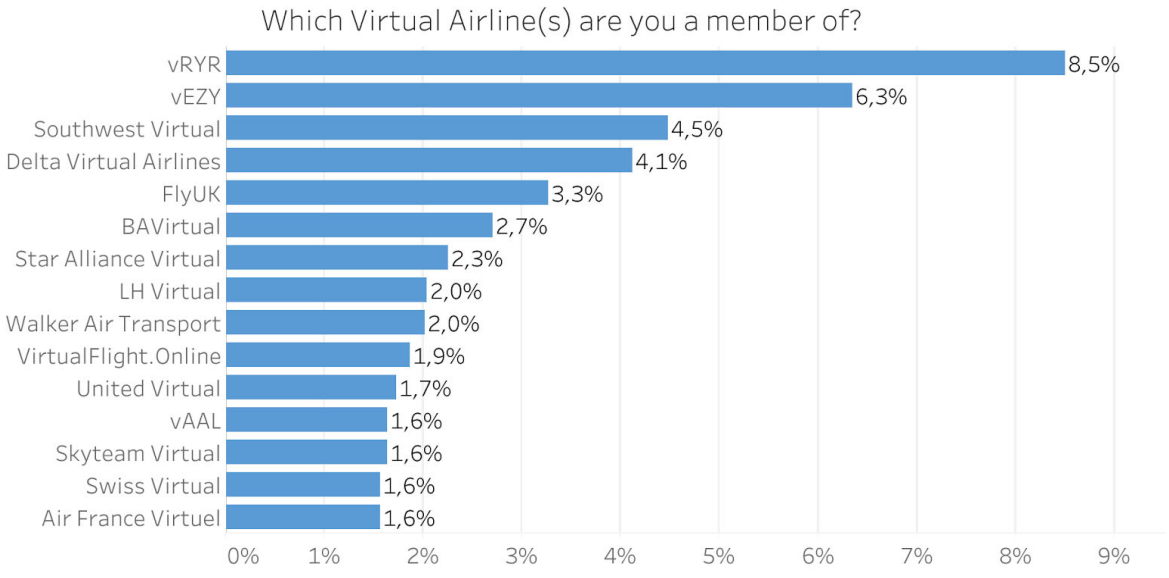
3.10.1. Membership

The following question was asked in the 2021 survey, in which 25.7% responded that they were a member of a virtual airline. In this year's survey, the percentage of respondents is slightly higher at 28.7%. This progression suggests a continued interest and engagement among respondents in the concept of virtual airlines over the two-year period.



3.10.2. Virtual Airlines

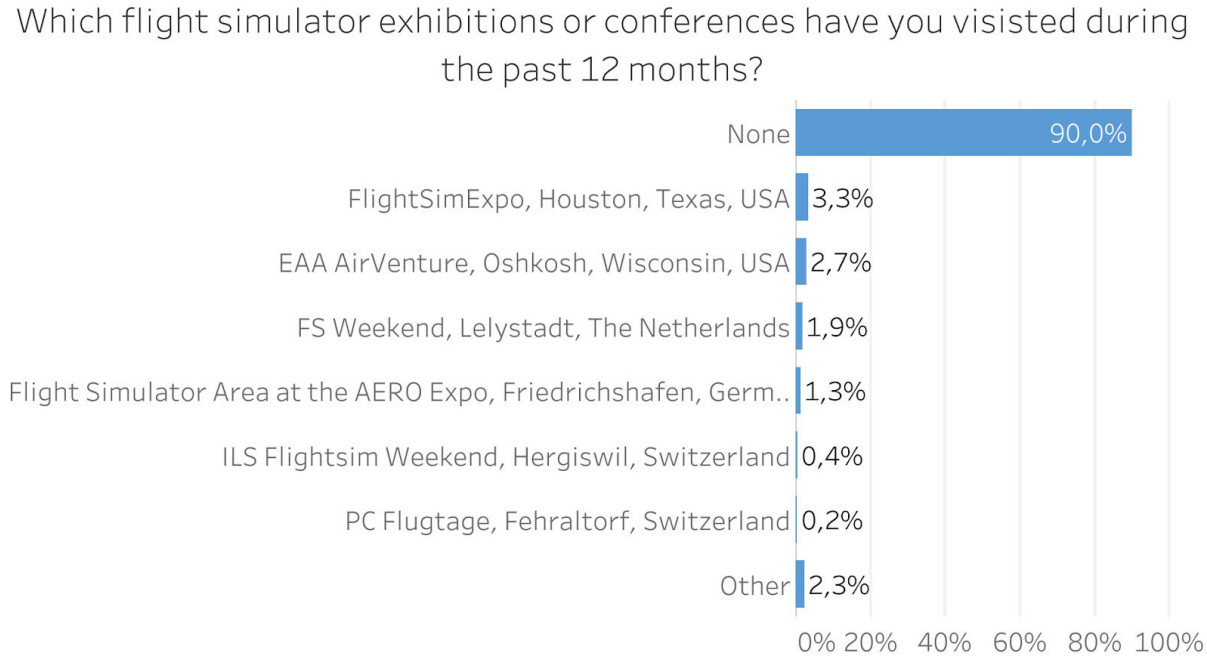
The following question was asked to those who responded "yes" in the previous question. It had a free text field, allowing respondents to type in the virtual airline(s) they are a member of. The results suggest that quite a few of the respondents are members of vRYR, vEZY, Southwest Virtual, and Delta Virtual Airlines.



3.11. Exhibitions & Conferences

3.11.1. Attendance

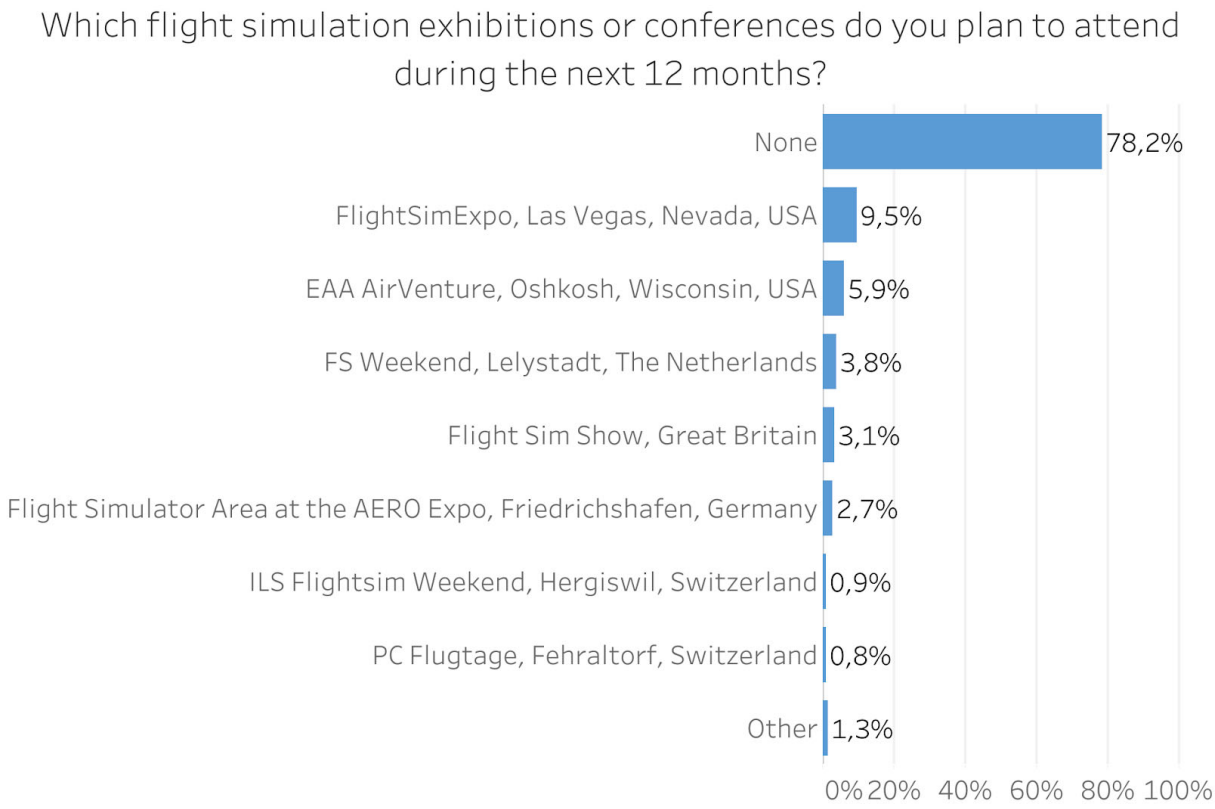
Responding to the subsequent question, 3.3% attended FlightSimExpo in Houston, and 2.7% participated in EAA AirVenture in Oshkosh this year. Additionally, 1.9% visited FS Weekend in Lelystad among those who responded to the question.



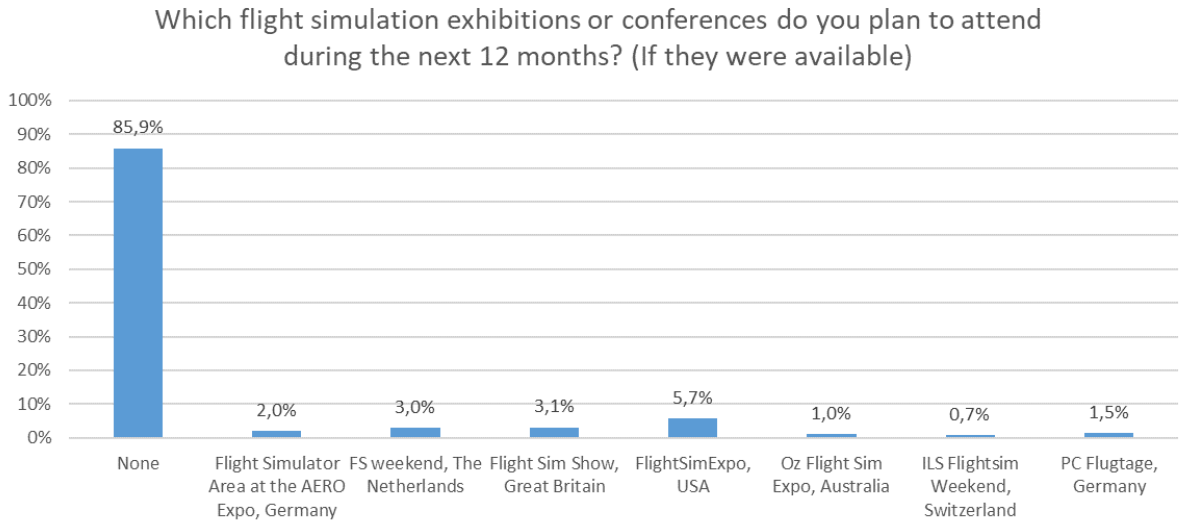
3.11.2. Planned

We asked the following question to better understand what exhibitions and conferences flight simmers intend to attend during the next 12 months.

These statistics highlight the widespread engagement of the respondents in major aviation events, emphasizing the significance of such gatherings in the flight simulation community.



Last year's result:



3.12. Consumption Habits

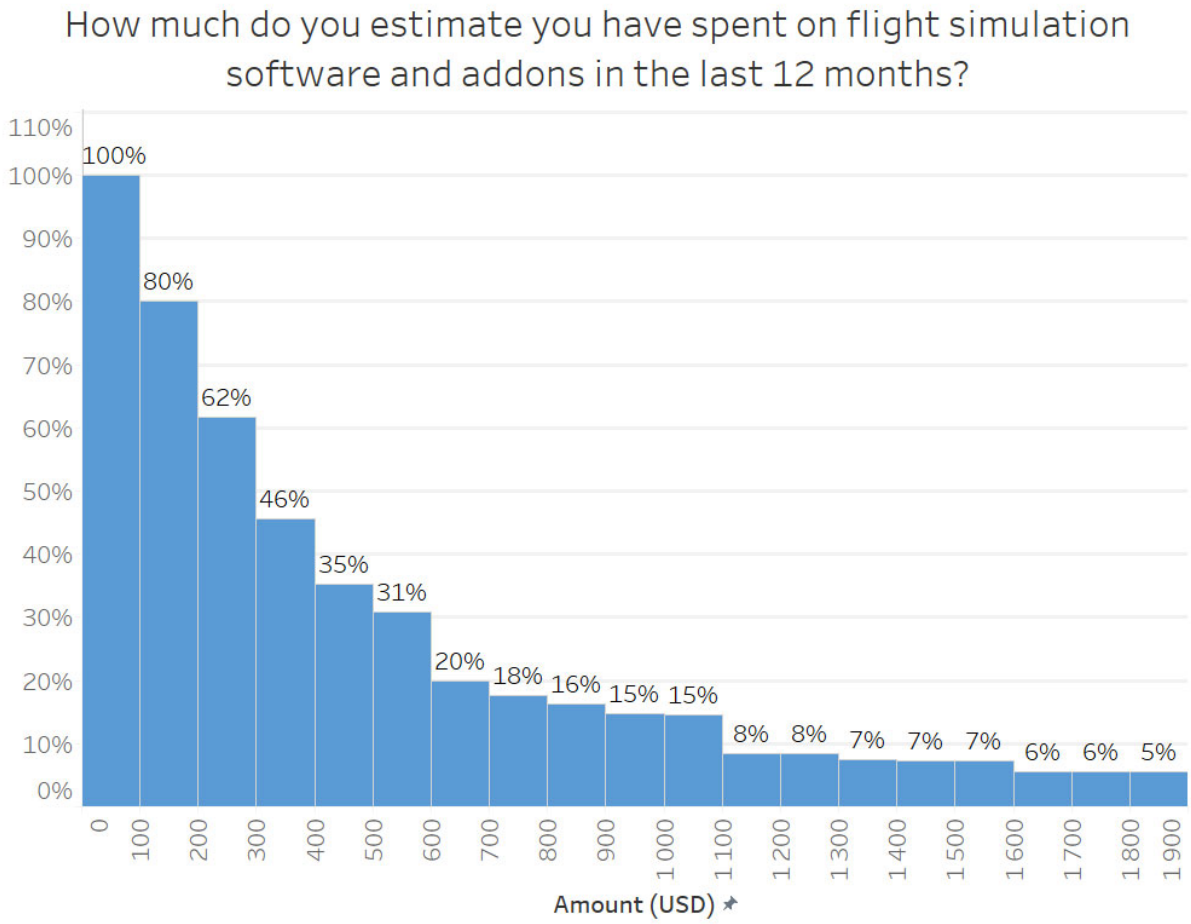
3.12.1. Software Expenses

Expenses are expressed as a cumulative graph. It should be read like this: 100% of the respondents have spent at least $0, 31% have spent at least $500, and so on.

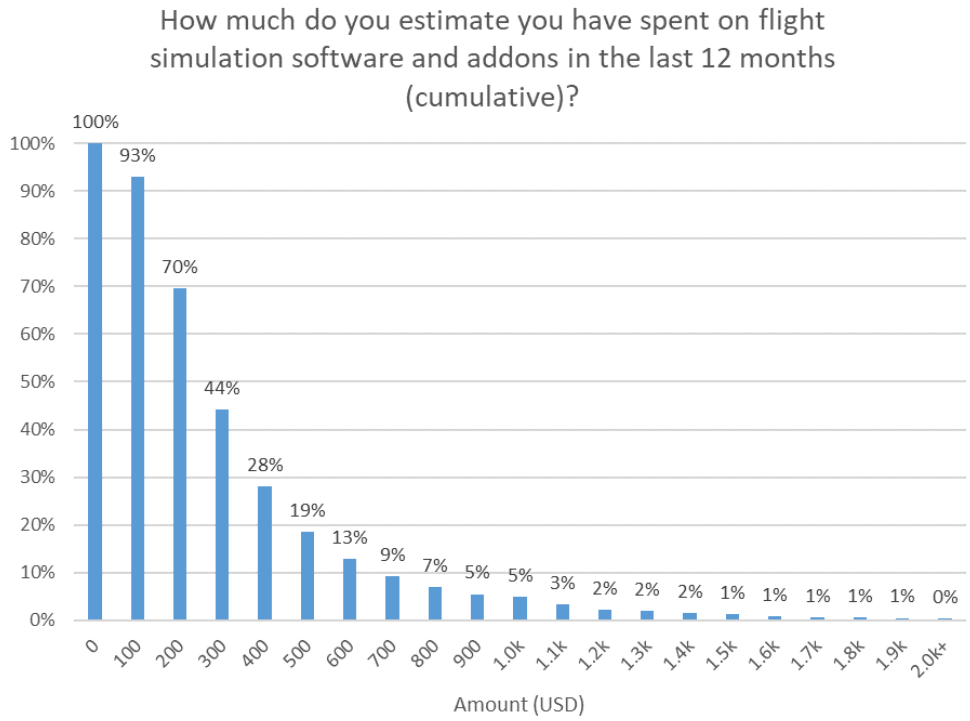
In previous years, we have asked the respondents to type their spending in their local currency. To increase the precision of the results, we decided to ask all respondents to type their spending in US dollars. We can however not rule out that this may affect the comparison to previous years.

At first sight, the distributions may look similar to the previous year. If we compare the numbers more closely, we can find some differences though. Those who spent at least $100-$300 have decreased, however, those who spent more than $300 have increased this year. Those who spent at least $1,000 this year have increased by 10 percentage points from 5% up to 15%.

The median software spending is $250 per year, which is more than last year's $223.

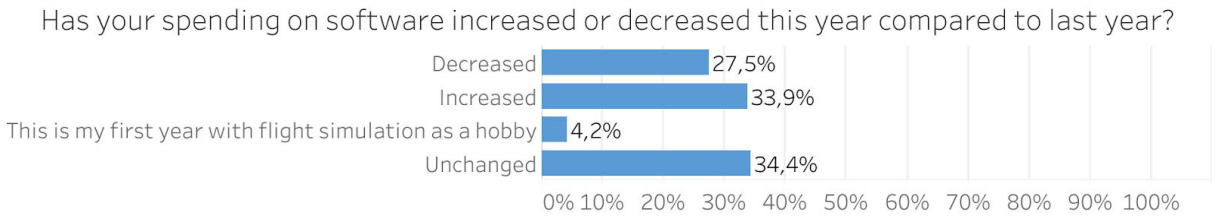


Last year's result:

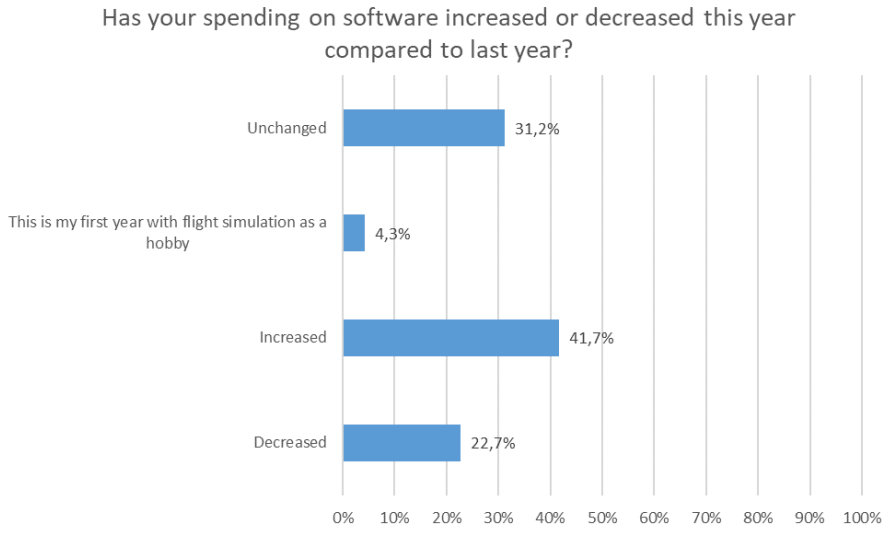


3.12.2. Software Expense Comparison

Last year, 41.7% of the respondents stated that their software spending has increased, while 22.7% have seen a decrease in their spending. This year, 33.9% of the respondents have had an increase in spending, while the spending for 27.5% has decreased. This indicates a dynamic and evolving pattern in how respondents allocate their budgets for flight simulation software, reflecting potential shifts in priorities or market influences.

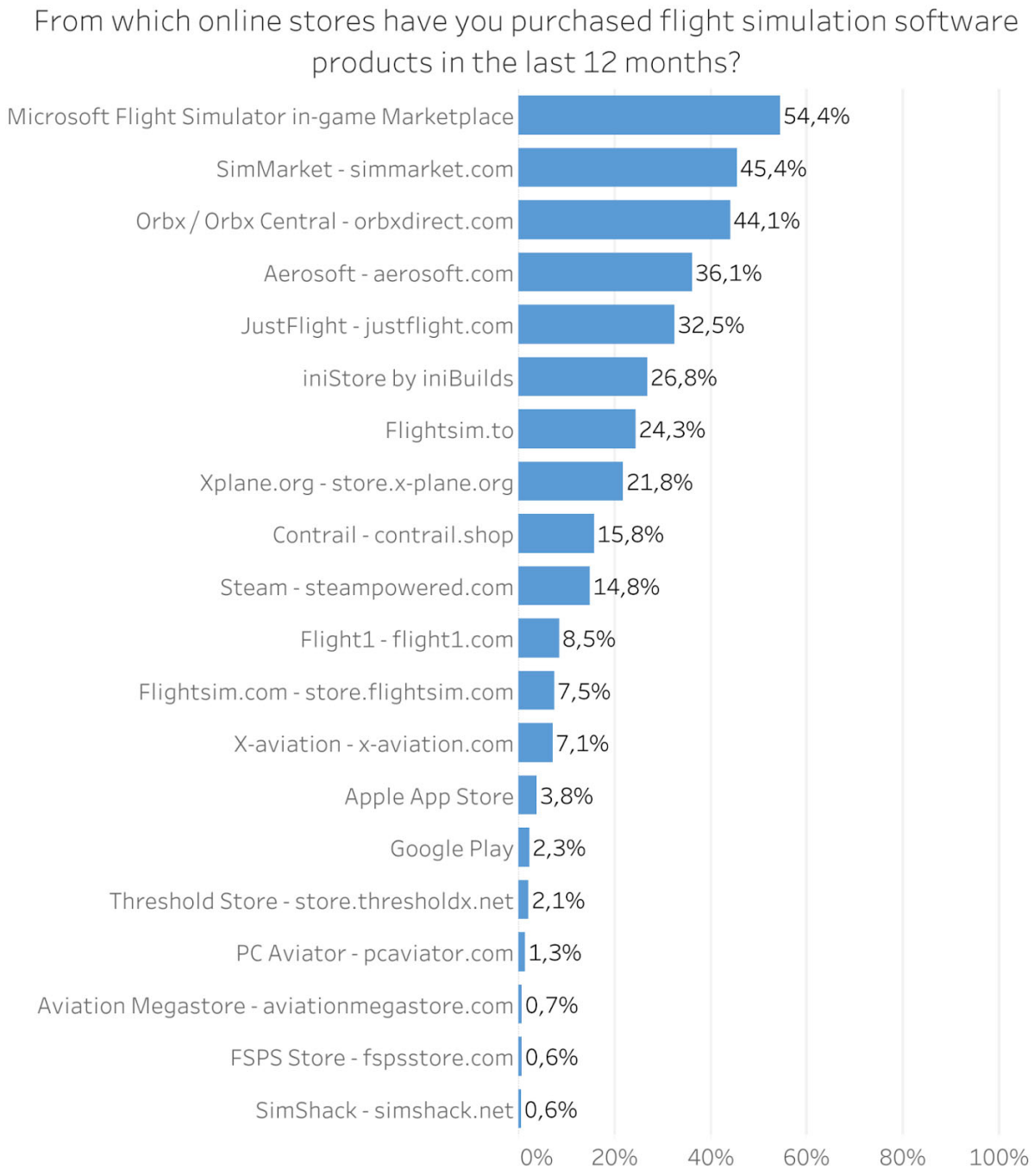


Last year's result:

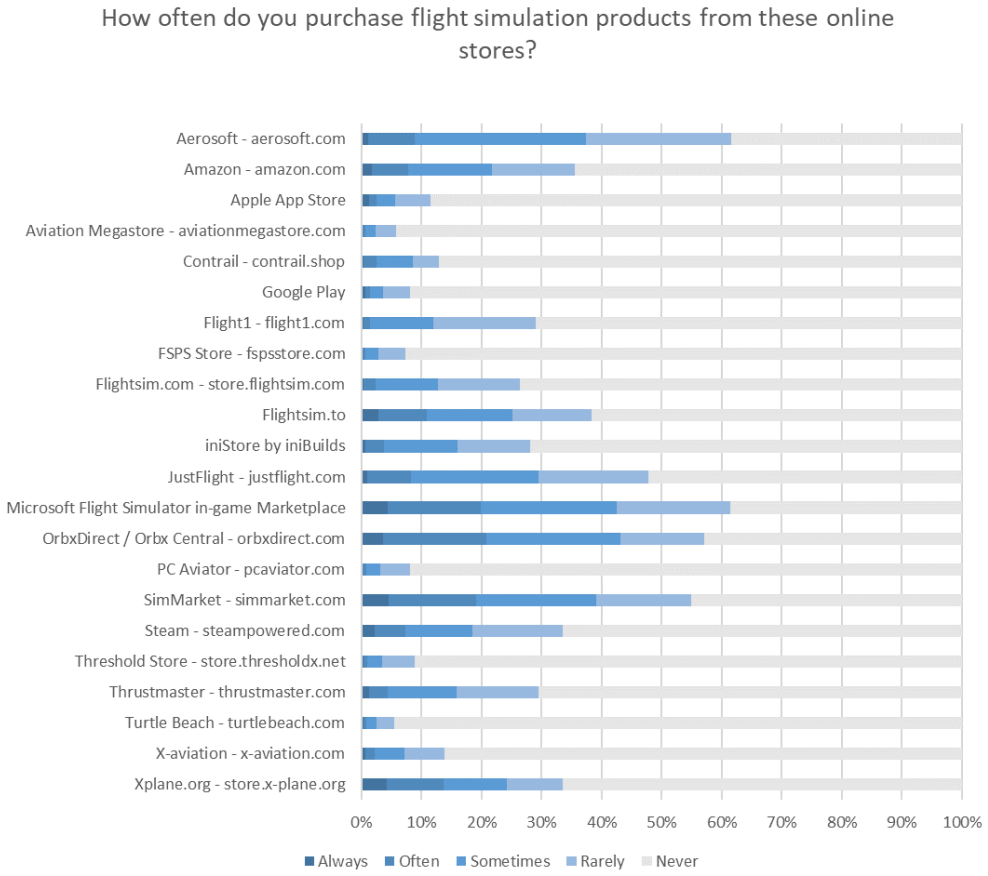


3.12.3. Online Stores for Software

Among the respondents who answered this question, 54.4% have purchased software from Microsoft Flight Simulator in-game Marketplace in the past 12 months, 45.4% have purchased from SimMarket, and 44.1% have purchased software from OrbX. The following question has been simplified, rephrased, and limited to only software. Consequently, making direct comparisons with the results from last year may not be appropriate.



Last year's result:



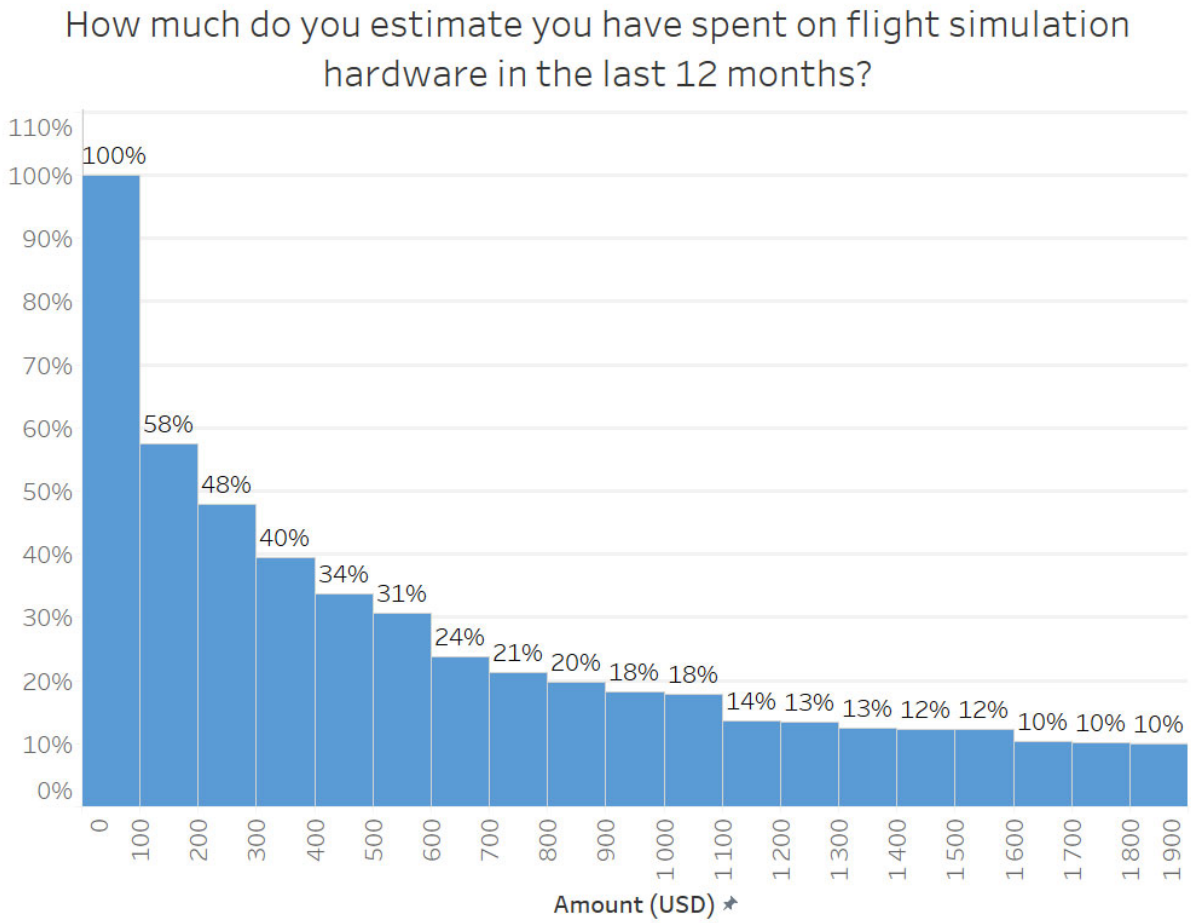
3.12.4. Hardware Expenses

Just like software expenses, hardware expenses are expressed as a cumulative graph. It should be read like this: 100% of the respondents have spent at least $0, 31% have spent at least $500, and so on.

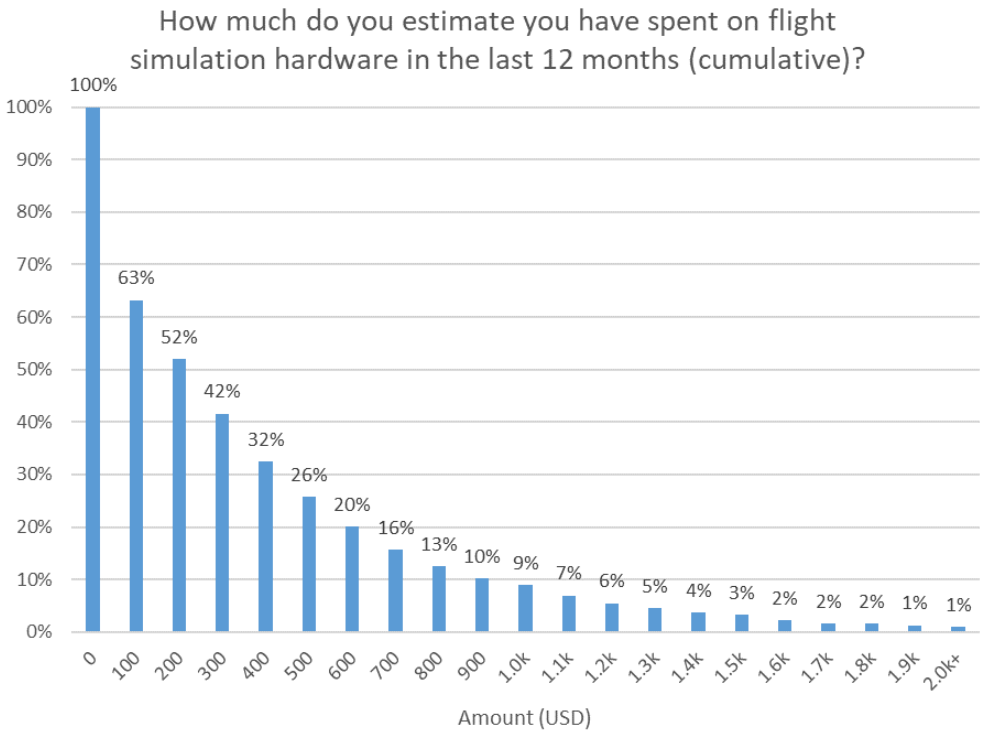
The previous year, we asked the respondents to type their spending in their local currency. To increase the precision of the results, we decided to ask all respondents to type their spending in USD. We can however not rule out that this may affect the comparison to previous years.

Similar to the software expenses, we find that there are fewer who spend a lower amount, and there are more who spend a higher amount. Those who spent at least $100-$300 have decreased, however, those who spent more than $300 have increased this year. Those who spent at least $1,000 this year have increased by 9 percentage points from 9% up to 18%.

The median hardware spending is $150 per year, which is the same as last year.

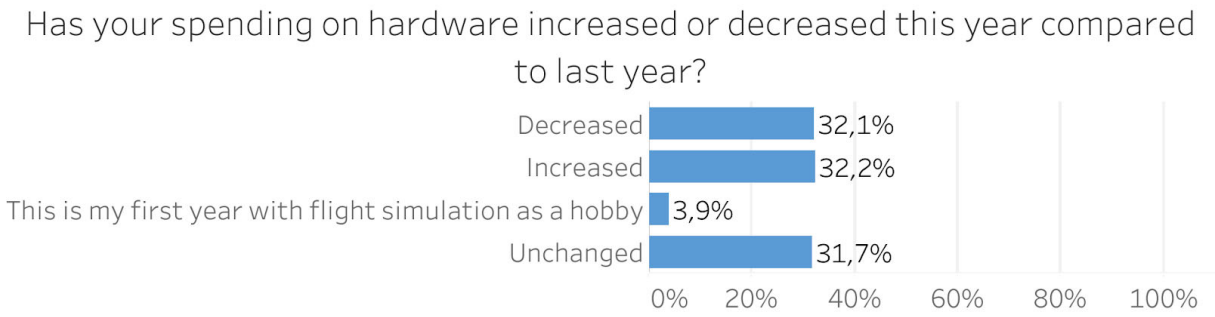


Last year's result:

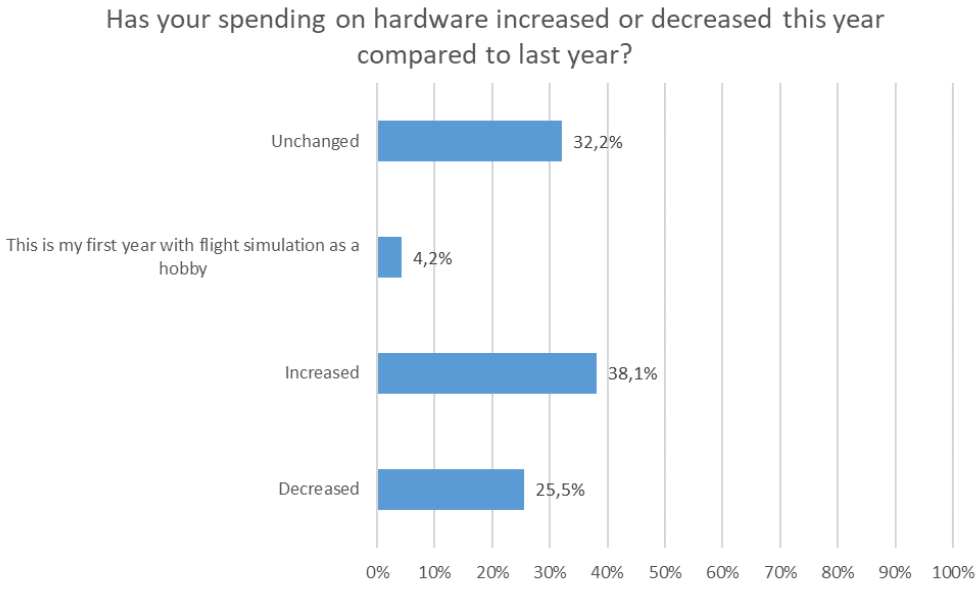


3.12.5. Hardware Expense Comparison

This year's results show that about one-third have stated that their hardware purchases have increased, and the same amount have stated that their hardware purchases have decreased. Last year, 38.1% reported an increase, while 25.5% reported a decrease. The current findings suggest a more evenly distributed pattern in respondents' decisions regarding hardware acquisitions, highlighting potential changes in factors influencing their investment decisions over the two years.

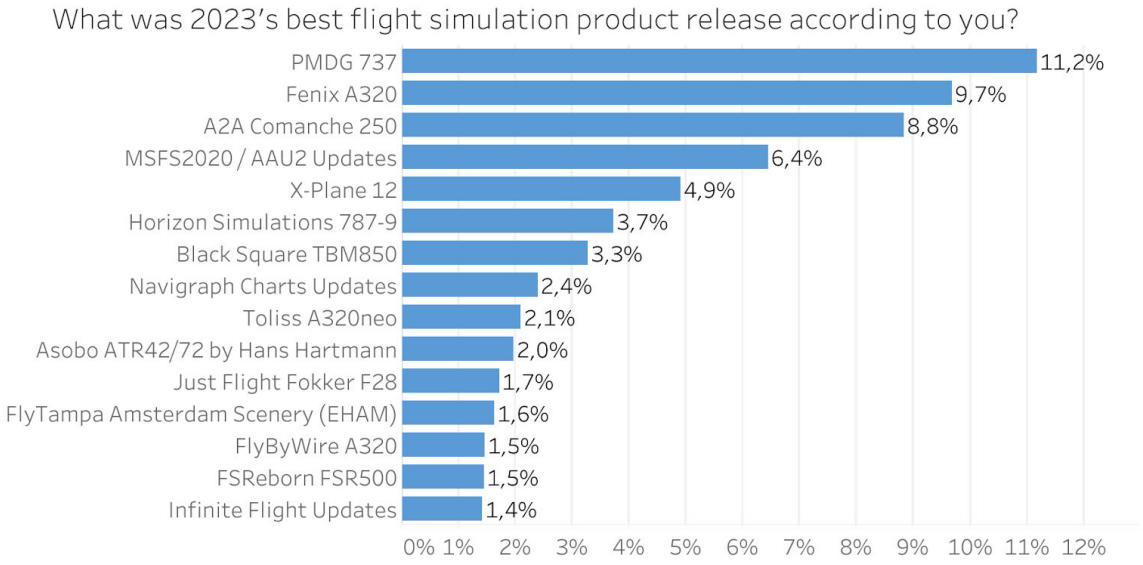


Last year's result:



3.13. Highlights

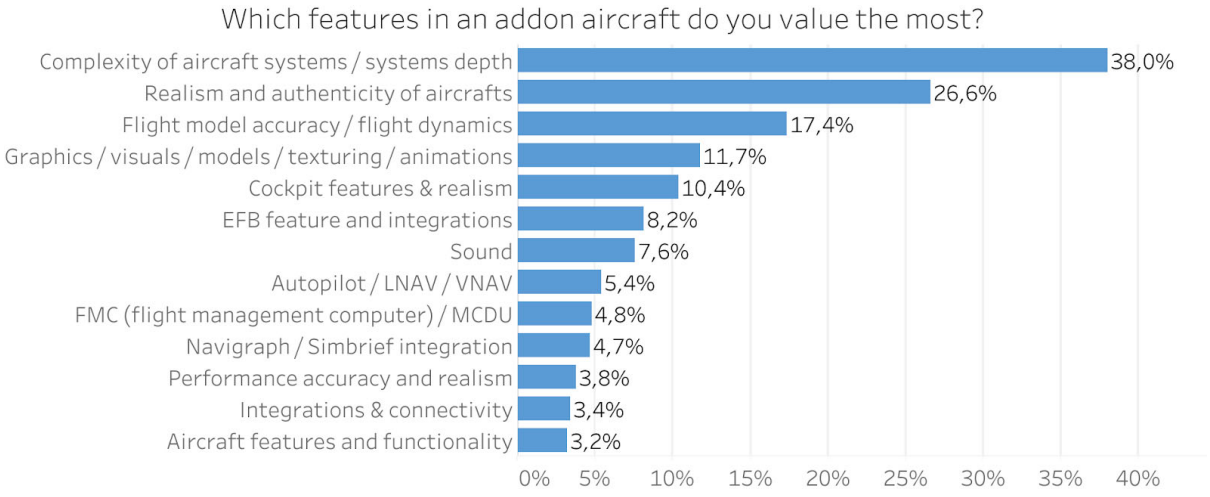
The following question had a free text field, in which respondents got to share the best flight simulation product release in 2023 according to them. The results show that the PMDG 737 got the most mentions, followed by the Fenix A320 and A2A Comanche 250. These mentions underscore the prominence of these particular releases within the flight simulation community, reflecting their significant impact and positive reception among enthusiasts.



3.14. Wants & Needs

3.14.1. Most Valued Aircraft Feature

The question “Which features in an add-on aircraft do you value the most?” had a free text field, allowing respondents to type in any features they value the most in an add-on aircraft. It turns out that many of the respondents value complexity of aircraft systems/systems depth, as well as realism and authenticity, emphasizing their prioritization of immersive and true-to-life experiences in the realm of add-on aircraft.



We also used AI to analyze the free-text responses to this question.

This report synthesizes the key features valued in aircraft according to user responses, offering insights into the priorities and preferences of the flightsim community. The findings emphasize a strong demand for realism, customization, and technological integration in aircraft design and functionality.
Customization and Tailoring: Users highly value the ability to personalize aircraft configurations, control settings, and interior designs. Customization extends to paint schemes, engine models, and modding opportunities, underscoring a desire for a personalized flying experience.

Cockpit Realism and Functionality: A detailed and accurate cockpit is crucial. This includes advanced 3D modeling, high-quality textures, and fully functional systems, reflecting the importance of an immersive and realistic environment where users spend most of their time.

Advanced Flight Dynamics: Realistic flight characteristics and aerodynamics are paramount. This encompasses precise control systems like fly-by-wire and interactive features, highlighting the importance of an authentic flying experience.

Technology Integration: Compatibility with advanced flight planning tools, simulation software, and technologies such as Simbrief and Electronic Flight Bags (EFB) is essential. Users emphasize the need for accurate flight management systems and seamless integration with external data sources and tools.

Authenticity and Accuracy: A significant focus is placed on achieving realistic aircraft behaviors, engine performance, and operational procedures. This includes realistic weather effects, accurate flight physics, and high system fidelity, underscoring the desire for an authentic flying experience.

Audio Quality: Accurate and immersive sound design, particularly engine sounds and cockpit audio features, are highly valued, enhancing the overall realism of the flight experience.

Optimized Performance: Users expect efficient and reliable performance, both in aircraft operation and simulator compatibility. There is a strong emphasis on optimizing frame rates and software stability.

Visual Excellence: High-quality textures and detailed visual modeling, both externally and internally, are crucial. The demand for graphical realism and photorealistic features highlights the importance of visual appeal in aircraft design. Comprehensive Documentation: Extensive manuals and detailed documentation are critical for safe and efficient aircraft operation. Ongoing developer support and regular updates are also highly valued.

Interactive Physical Elements: Functional and clickable controls, with attention to detail in modeling and animation, are essential. This includes the integration of interactive cockpit elements and the ability to simulate real-life scenarios.

System Depth and Study-Level Detail: There is a strong demand for in-depth and accurate systems modeling, including failure simulation and real-world scenario replication. Users desire aircraft with comprehensive system details and functionalities for a more educational and engaging experience.

Overall Flying Experience: The combined factors of realism, functionality, and immersion contribute to the overall satisfaction of the user. The aircraft should offer a balanced and engaging experience, meeting the high expectations of realism and enjoyment in flight simulation.

In conclusion, the findings highlight a user base that is discerning and detail-oriented, with a clear preference for high levels of realism, detailed customization options, and sophisticated technology integration in aircraft design and functionality.

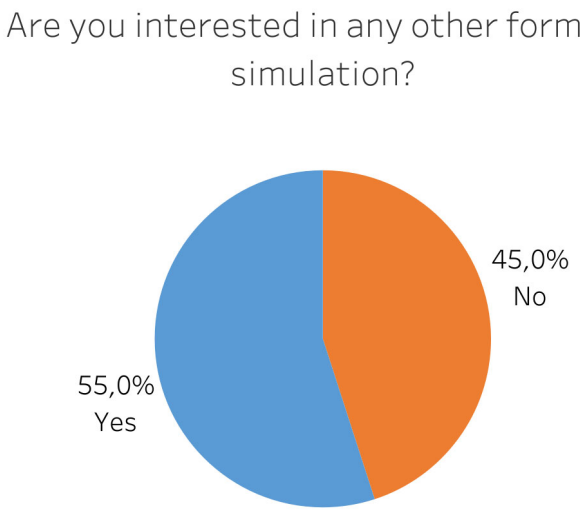
3.14.2. Missing Hardware

We collected the answers to the question “What hardware are you currently missing?” using a free text response field. Unfortunately, the question was posed too generally which resulted in varying and heterogeneous responses. Despite tuning our AI algorithms we were not able to produce a conclusive result to this question.

3.15. Other Simulation & Gaming

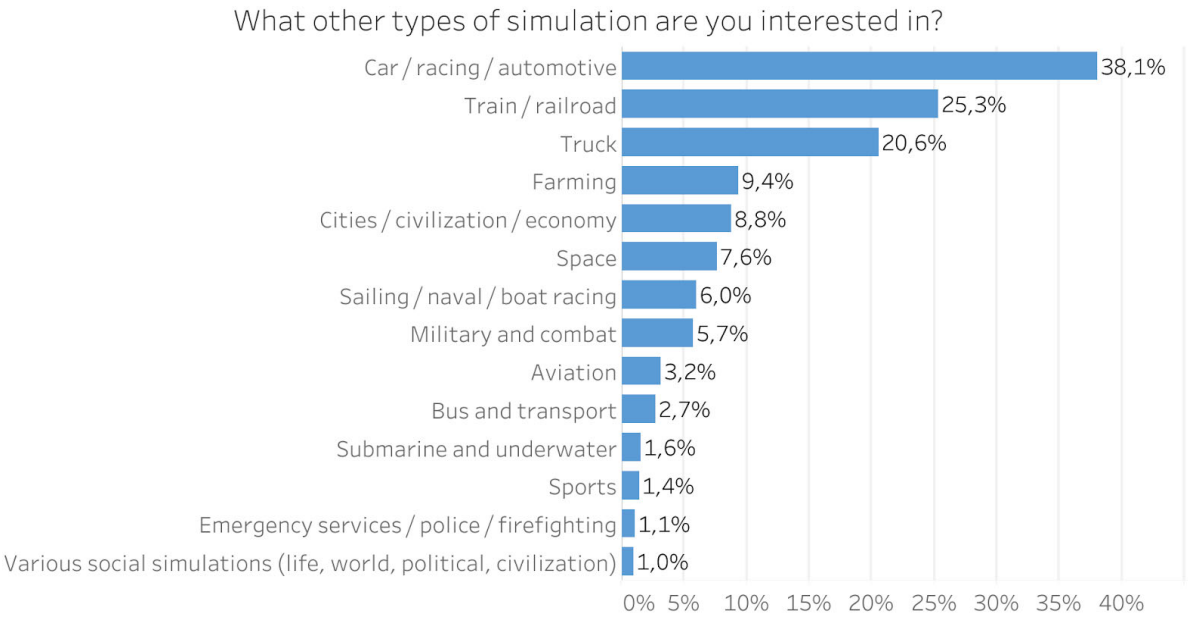
3.15.1. Other Simulation

The following question is new for this year's survey. It turns out that more than every other respondent is interested in other forms of simulation.



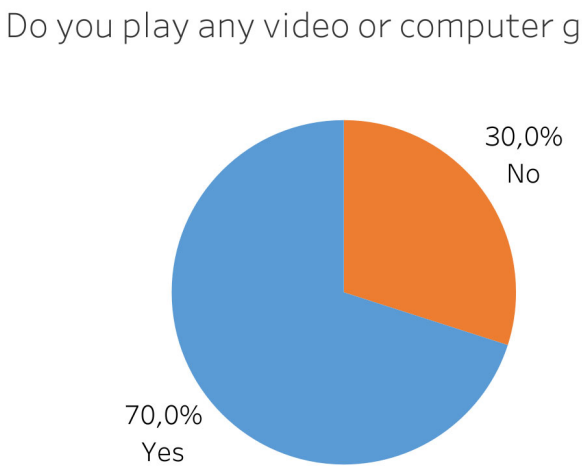
3.15.2. Other Interests

Exploring the respondent's inclination towards alternative simulation experiences reveals a notable diversity beyond aviation in our survey. The top five alternative simulations garnered significant attention, with Car/Racing/Automotive emerging as the predominant interest, highlighting a collective passion for vehicular experiences. Train/Railroad and Truck simulations followed closely, showcasing a strong affinity for ground-based transport scenarios. Surprisingly, Farming simulations and the intricate management of Cities rounded out the top five, reflecting the community's nuanced engagement with diverse virtual environments.



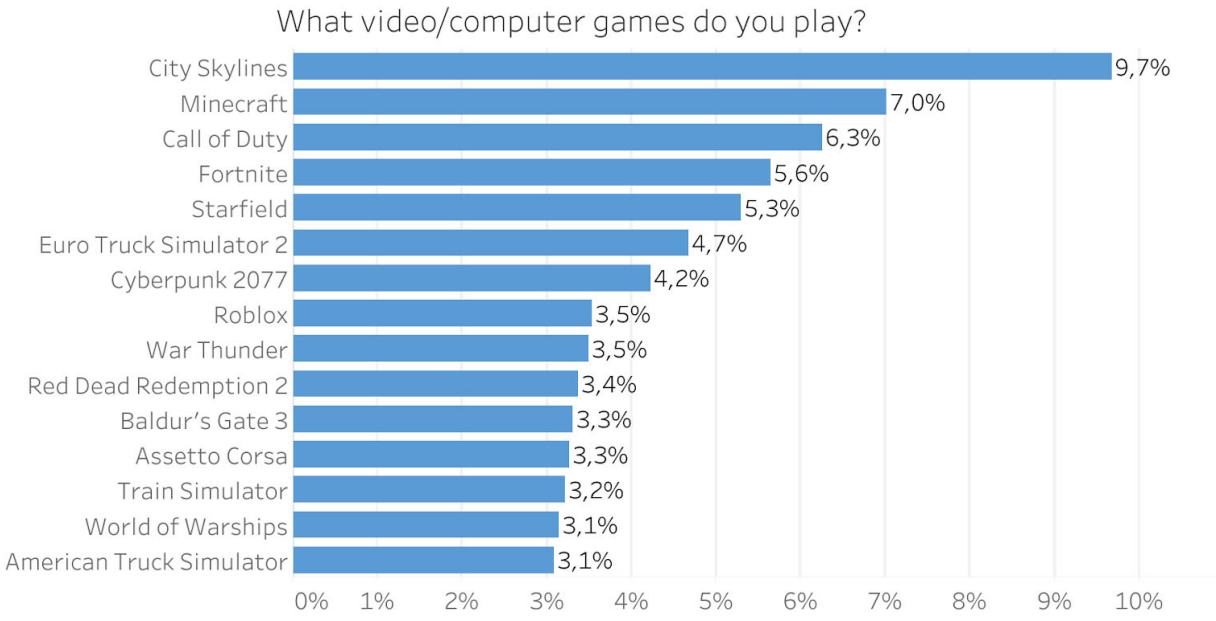
3.15.2. Gaming

We can establish that 70% of those who responded to this question play other video and computer games.



3.15.3. What do you play?

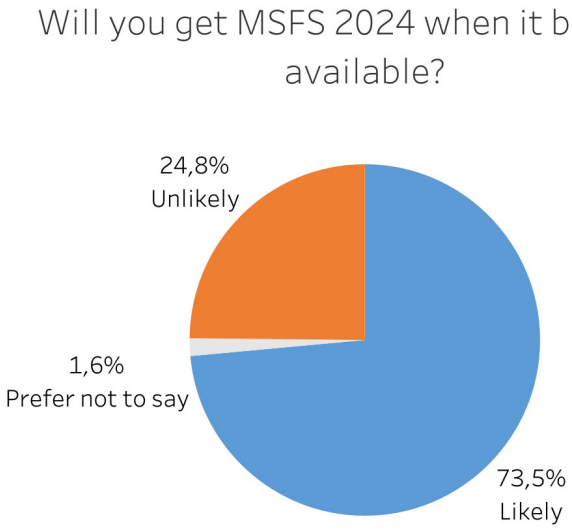
This question was only asked to the respondents who answered yes to the question “Do you play any video or computer games?” The results show the top 15 answers by the respondents. City Skyline stands out as the most prevalent choice, capturing 9.7% of respondents’ preferences. Minecraft follows closely in second position at 7%, suggesting a substantial interest in sandbox-style gameplay. In the third position, Call of Duty holds sway with 6.3%, reflecting a persistent appeal for action-oriented gaming experience.



3.16. The Future

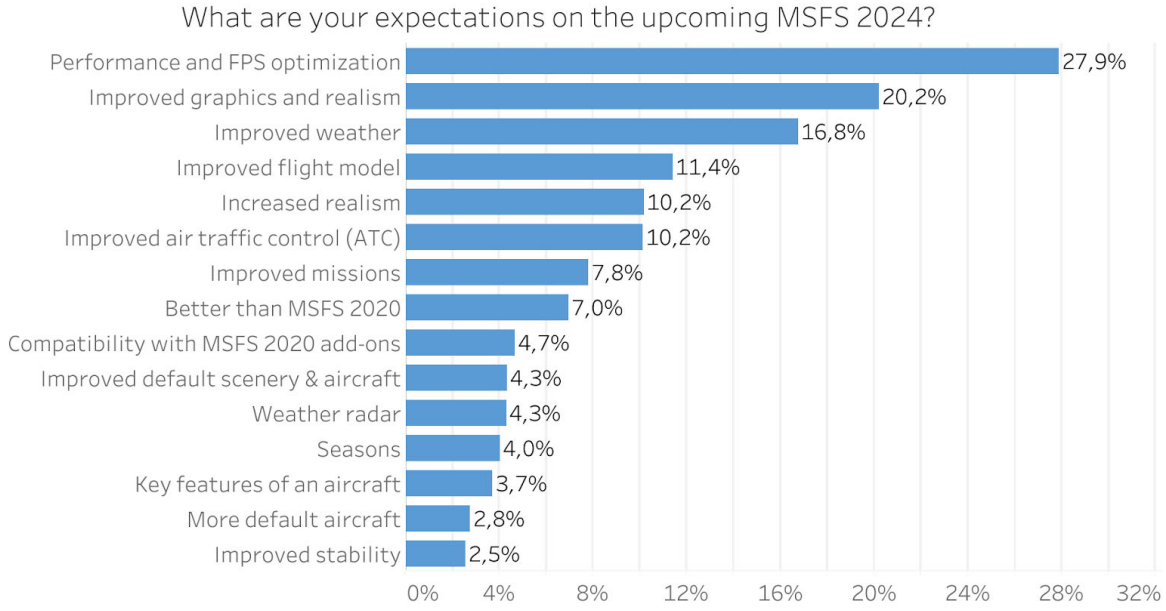
3.16.1. MSFS 2024 Purchase Likelihood

In 2019, we asked about the purchase likelihood of MSFS 2020, in which 63% of the respondents were likely or very likely to replace their current simulator with MSFS 2020. This year, we find that more than 73% of the respondents are likely to purchase the new MSFS 2024.



3.16.2. MSFS 2024 Expectations

Among those who responded that they are likely to purchase MSFS2024 when it becomes available, 27.9% are expecting performance and FPS optimizations. Additionally, there is a shared anticipation for improvements in graphics and realism, advancements in weather simulation, and enhanced flight modeling, illustrating a collective desire for a more immersive and technically refined flight simulation experience in the forthcoming MSFS2024 release.



Performance Optimization: Users are looking for better performance, particularly regarding multi-threading capabilities for improved CPU usage and frame rates. There is a strong emphasis on the game making better use of modern hardware.

Enhanced Graphics and Realism: Users anticipate significant advancements in graphics, with more detailed scenery, updated textures, and a focus on realism in landscapes and environments. Expectations include better modeling of the natural world, realistic seasonal changes, and enhanced photogrammetry.

Advanced Weather Systems and Emergencies: Expectations include improved weather simulation, better emergency situations, search and rescue simulations, and a more dynamic weather experience, enhancing the realism of flying conditions.

Improved Aircraft Models and Variety: A wider variety of aircraft, both commercial and non-commercial, is desired. Users hope for new liveries, more realistic flight models, and the inclusion of unique aircraft types such as airships.

Realistic Flight Experience: Many users desire the simulator to be as realistic as possible, with a wide range of realistic experiences, pushing the boundaries of authenticity in flight simulation.

Refinement of Previous Features: Expectations include the inclusion and refinement of features promised in MSFS 2020 but not fully realized. Users hope for a version that evolves and iteratively improves upon the 2020 features.

Compatibility with MSFS 2020 Add-Ons: High expectations exist for seamless compatibility between MSFS 2020 and MSFS 2024, with users hoping to transfer all add-ons and DLCs without additional costs or reinstallation.

Improved Game Physics: Anticipation for improvements in-game physics, including more realistic mechanics and hydraulics, to enhance the overall simulation experience.

Stability and Reduced Technical Issues: Users expect a more stable simulator with fewer crashes, faster load times, and prioritization of bug fixes over excessive updates.

Content Management and Marketplace Improvements: Hopes for better content management, more freeware in the marketplace, and improved moderation and review systems to ensure higher quality add-ons.

Enhanced Multi-Screen and Display Support: Expectations for better support for multiple screens and displays, including multi-window functionality and networked multi-monitor use.

Focus on Commercial Flights and Aviation: Users are looking forward to content that emphasizes commercial flights, with various missions and immersive experiences.

Concerns About Microtransactions and Add-Ons: Some users express concerns regarding the potential for excessive microtransactions and the reliance on add-ons.

Ground Detail and Operations: Expectations for improved ground detail, better ground operations, and more realistic ground handling experiences.

Customization and Modularity: Desire for more customization options in graphics settings, mod possibilities, and cockpit configurations.

Home Cockpit Support: Anticipation for better integration and compatibility with cockpit software and customizable cockpit environments.

VR Support and Compatibility: Expectations for continued and enhanced VR support, ensuring compatibility and a seamless VR experience.

ATC System Improvements: Hopes for a more realistic and functioning ATC system with better offline and AI traffic management.

VFR and IFR Enhancements: Expectations for improved VFR visuals and scenery, as well as better functioning IFR systems and ATC interactions.

Diverse Missions and Activities: Users hope for a variety of missions, including career or event modes, providing reasons to fly different planes and visit new places.

Ground Detail and Photogrammetry: Expectations for enhanced ground detail and more realistic photogrammetry, particularly in less well-represented regions.

General Performance Enhancements: Anticipations for improvements in general performance, include smoother gameplay, less stuttering, and better online connectivity.

Hardware Utilization and Efficiency: Users expect the simulator to perform better on current systems, utilizing modern hardware efficiently.

Interactive Environment and Transport Diversity: Hopes for an immersive experience beyond flying, including trains, road traffic, and other transportation forms.

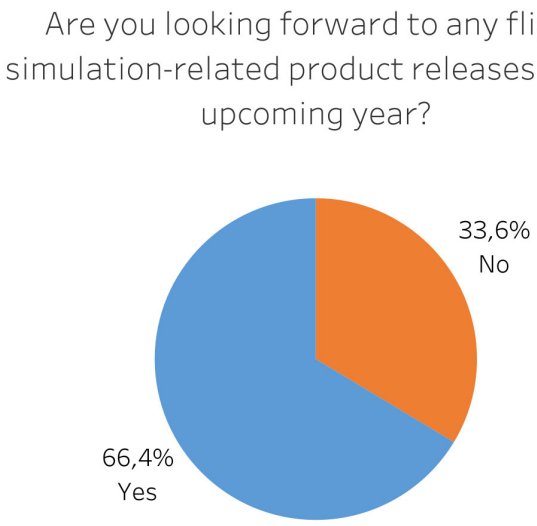
Positive Initial Reactions: Many respondents express a positive outlook based on pre-release trailers and announcements.

Uncertainty and Lack of Knowledge: A notable number of respondents are unsure of what to expect, indicating uncertainty about the game's plans, updates, or features.

Overall, the community anticipates a significant leap forward in Microsoft Flight Simulator 2024, focusing on realism, performance, compatibility, and diversity in flight simulation experiences.

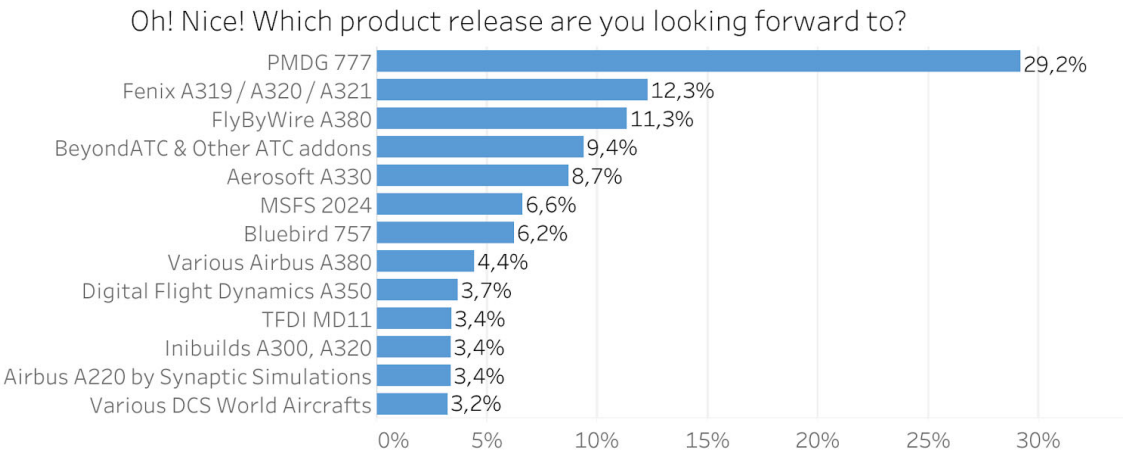
3.16.3. Other Product Expectations

This year we added a new question to see if you were looking forward to any upcoming releases. As you can see in the graph below, 66.4% of the respondents said Yes to this question



3.16.4. What are you looking forward to?

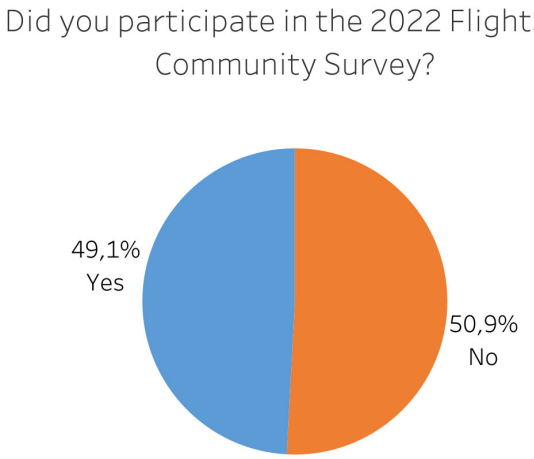
This question was only represented to the ones that answered yes to the previous question. The question had a free text field, allowing respondents to type in any product they wanted. The results suggest that 26.9% of the respondents are looking forward to the release of PMDG 777. 11.3% of the Fenix A319/A320 V2 Block 2/A321 releases and 8.6% look forward to the release of BeyondATC and other ATC addons.



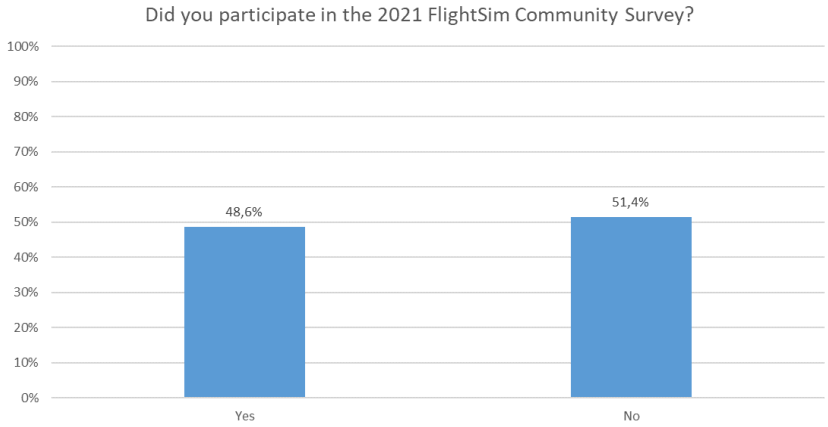
3.17. Survey Meta Analysis

3.17.1. Participation

In the last three years, it has been consistently observed that approximately half of the respondents have taken part in the survey from the preceding year. The current year follows the same pattern.



Last year's result:

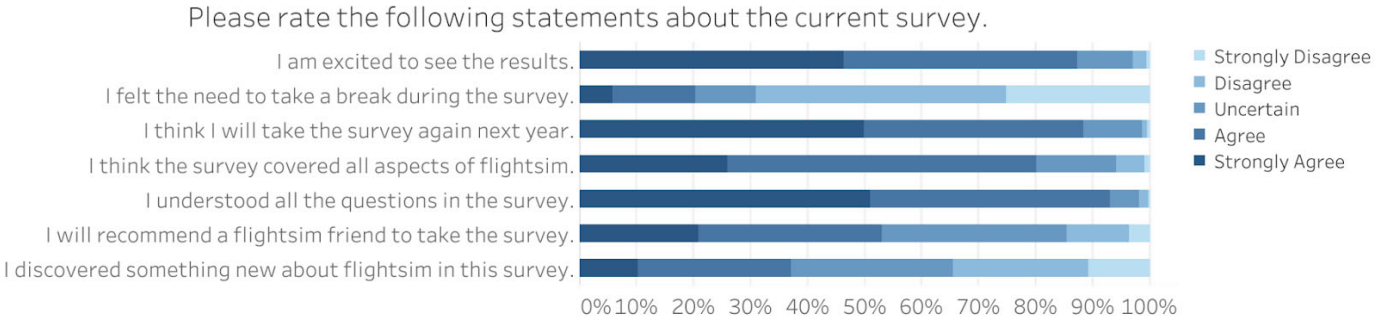


3.17.2. Survey Experience

This question was introduced in the 2019 survey to investigate how the respondents experienced the survey, and give information on how to improve the survey format.

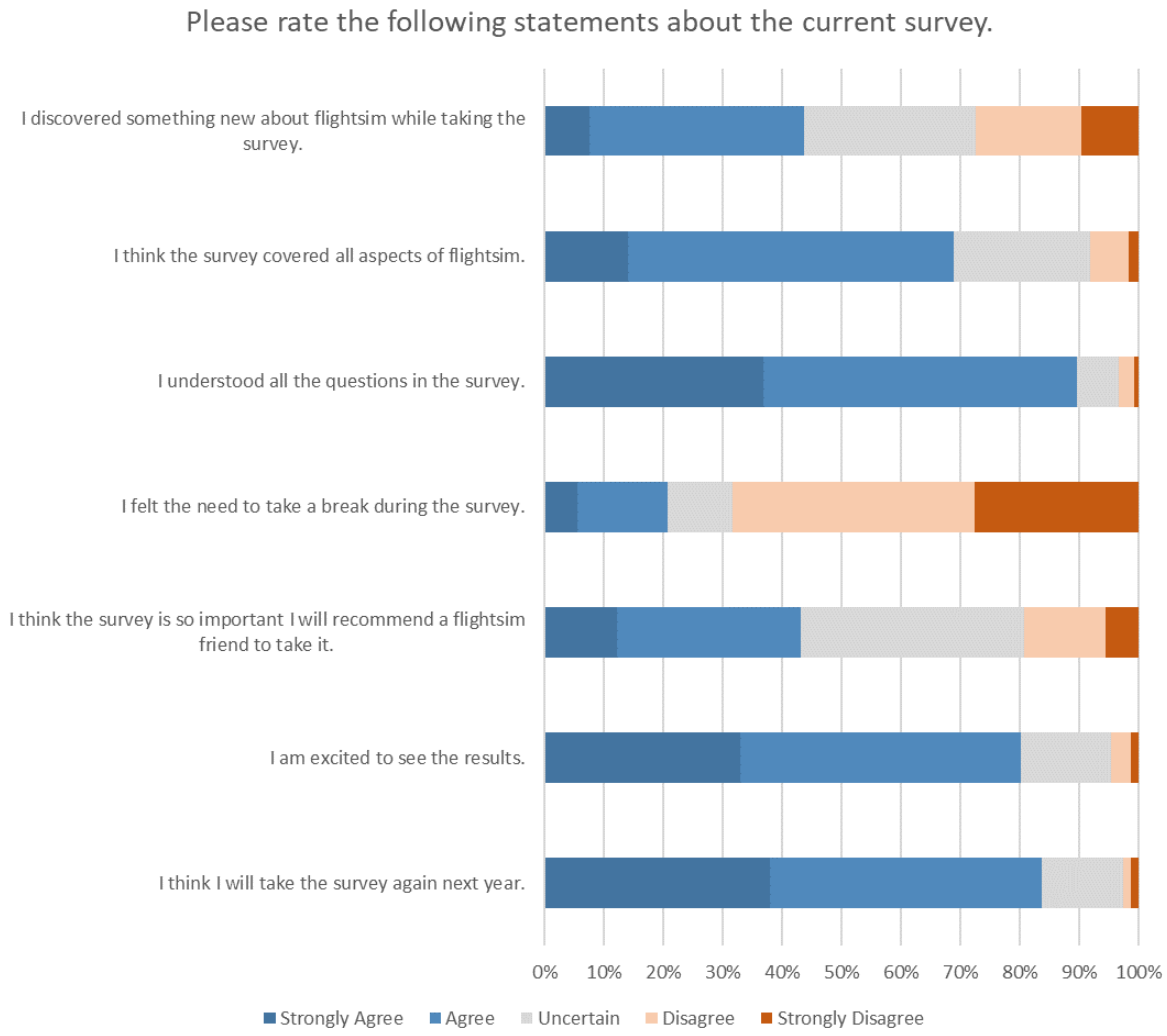
This survey has had 119, 93 and 67 questions in 2020, 2021 and 2022, respectively. This year there were 82 questions. While the survey was not made shorter, we instead introduced many conditional questions which limited the number of questions each respondent answered.

This year the completion rate rose from 63% to 66% compared to last year.



We are happy to note that not too many felt like they needed to take a break while taking the survey. We also note that respondents think the survey covered more aspects of flightsim compared to last year.

Last year's results:



4. Results

4.1. First, a Word on Sampling Bias and Validity

Since respondents were not selected according to a random sampling technique, but instead voluntarily chose to participate themselves, there may be a bias in the data collected. This is true for any survey where respondents are invited to participate without randomizing the respondent selection according to the topics the survey set out to investigate.

We want to highlight the fact that this chapter is merely summarizing the collected survey data - not drawing any conclusions. Since we cannot check whether the dataset is a representative sample of the flight simulation population, we do not conclude anything with absolute certainty. For this reason, we have chosen not to calculate confidence intervals or margin of errors.

So, what can be said about this dataset? First of all, with 23,736 respondents, this dataset must be considered to be large compared to other surveys of its kind. The bigger the sample, the more likely that it is resembling the population. A high number of respondents can mitigate the effect of any selection bias which may be present. Secondly, while the dataset may not be generally conclusive for the entire population, we can still claim that the 23,736 respondents that decided to participate in the survey did indeed respond this way.

Thirdly, we can track trends and make relative comparisons between years. 50.9% of this year's participants were new to the survey and did not take the survey last year. Many of the survey questions have same, or very similar, distributions when comparing two consecutive years. If a sampling bias were present, one might anticipate some variance between years – especially when each year has approximately 50% new respondents. If the variance between samples is low one might reason that the result is representative of the population – or that the same type of bias is present in both samples. Low variance in samples over consecutive years may increase the confidence of a representative result, but we will still not be able to be unquestionably certain. With these words of caution let's consider the data that was collected.

4.2. Brief Summary

Even though every other respondent did not take the survey last year, most of the results are very similar to the 2022 survey. Where we can, we have provided data from previous years next to the diagrams.

Here is a brief non-exhaustive summary of the results:

- Age ranges from 15-85 years, with a notable peak around 15.
- 97.3% of respondents are male.
- Most of the respondents come from the US, the UK and Germany.
- The typical household size is 2.
- 41.3% of respondents above the age of 17 are married.
- Video gaming and listening to music are common pastime interests.
- The majority have a high-school or bachelor's degree.
- 50.3% are Employed full time; 15.4% Retired; 12.4% in School; and 4.0% in University.
    - 23.7% of Employed are working with Computer and Technology; 13.5% within Transportation; 13.4% within Aerospace.
    - 20.6% of Employed work within Aviation.
        - 29.7% of Employed within Aviation are Pilots; 12.3% Aircraft Maintenance Engineer or Technician
- 34% were introduced to flight simulation at the age of 10-15 years.
- 20.7% have a pilot license.
    - 50.8% of pilots have a PPL; 17% a CPL; 13.9% a ATPL; 8.7% a student pilot license.
    - 49% of pilots have an instrument rating; 45.3% night rating; 33% multi engine rating.
    - 80.1% of pilots state flight simulation interest facilitated their pilot training.
        - Pilots who stated flight simulation facilitated their pilot training thought IFR training and procedures practice were helpful in the simulator. To be able to practice at home and gain fundamental knowledge were also common replies.
- 18.7% of the respondents that currently hold a pilot's license are enrolled in flight school.
    - Of those not enrolled in flight school, 28.1% are considering taking classes in the coming 12 months.
- 42.2% of respondent's main purpose for flight simulation is "Curiosity/Interest in Aviation". "Casual Gaming/Entertainment" is also a common purpose. Least common purpose is "Training towards pilot license".
    - Respondents stating "Entertainment" enjoy realism and role playing aspects, and the possibility to fly different aircraft.
    - Respondents stating "Training" use the simulator for instrument rating preparation among other things.
    - Respondents stating "Staying current" use the simulator for practicing flight skills, instrument proficiency, and procedure training.
    - Respondents stating "Familiarization" use the simulator to familiarize themselves with aircraft systems, airports and procedures.
    - Respondents stating "Curiosity" use the simulator to learn how to operate an aircraft, and to fly several different aircraft models.
- 92.4% of respondents use a Desktop Computer as their primary flight simulator platform.
- 66.1% of respondents own a throttle quadrant; 58% pedals; 53.9% joystick; 48.5% yoke.
- 7.3% of respondents own an Xbox compatible with flight simulation software.

- 17.9% of respondents own a VR headset which they also use for flight simulation. This is a notable increase since last year's 10.1%.
    - HP Reverb G2 is the most common headset, followed by Oculus Quest 2.
    - VR users use Microsoft Flight Simulator, DCS, and X-Plane.
- The most popular graphics card among respondents is NVIDIA GeForce RTX 4090.
- The most frequently occurring RAM size among respondents is 32 GB.
- The most popular flight simulator software among respondents is Microsoft Flight Simulator, followed by Laminar Research X-Plane.
- The most popular flight planning software among respondents is SimBrief.
- The most popular chart software among respondents is Navigraph Charts.
- The most popular visual flight tracking software among respondents is Navigraph Simlink/Navigraph Charts Moving Maps.
- Respondents typically use the flight simulator 2-5 times per week in 2-3 hour sessions.
- Respondents tend to fly IFR in narrow or wide body commercial airliners, but single engine pistons and turbo props are common too.
- The most commonly flown addon aircraft among respondents for Microsoft Flight Simulator is Fenix Simulations Airbus A320 and PMDG Boeing 737-800.
- FSElite the most popular flightsim media among respondents.
- 47.9% of respondents have flown on an ATC network in the past 12 months.
    - 88.7% fly on VATSIM and 17.3% fly on IVAO.
- 28.7% of respondents are members of a virtual airline. vRYR, vEZY, Southwest Virtual and Delta Virtual Airlines are popular VAs.
- 9.5% of respondents plan to attend FSExpo in Las Vegas 2024.
- The median software spending per year is $250, which is more than last year's $223.
- The median hardware spending per year is $150, which is the same as last year.
- The distribution of hardware and software spending trends have shifted among respondents compared to last year.
- 54.4% of respondents have purchased software from Microsoft Marketplace in the past 12 months; 45.4% from SimMarket and 44.1% from Orbx Central.
- Respondents think the PMDG Boeing 737, Fenix A320 and A2A Comanche 250 were the highlights of the past year.
- Respondents value system complexity, systems depth, and aircraft realism the most in addon aircraft.
- 55% of respondents are interested in other forms of simulation.
    - 38.1% are interested in car or racing simulation; 25.3% in train simulation; and 20.6% in truck simulation.
- 70% play other video or computer games.
    - City Skylines, Minecraft, and Call of Duty are popular games.
- 73.5% of respondents are likely to purchase the new Microsoft Flight Simulator 2024 when it becomes available.
    - Respondents have particularly high expectations on performance and fps optimization; improved graphics and realism; and improved weather.
- 66.4% of respondents are also waiting for some other product releases in the upcoming year.
    - 29.2% are looking forward to PMDG 777.
- 49.1% had taken this FlightSim Community Survey the past year.

4.3. Discussion

4.3.1. Simulation Platform Popularity

One of the most anticipated questions in the survey is “How often do you fly any of the following flight simulator software?”.

Looking at the diagram in 3.6.1. Simulator Preference, Microsoft Flight Simulator 2020 (PC) is the most popular flight simulator among the survey respondents this year. Compared to last year, more of its users claim to fly the simulator not just “Frequently”, but “Most of the time”. Last year 55.9% said they flew the simulator “Most of the time”. This year it’s 63.2%.

When analyzing the “Most of the time” responses for other simulators, we see X-Plane 12 in second place at 12.8% followed by DCS World in third place at 6.8%. In fourth place we see X-Plane 11.50 at 5.8%, and in fifth place we find Infinite Flight at 4.7%.

Another way to understand this data is to look at the diagram in 3.6.2. Primary Flight Simulator, presenting the results of the question where we asked users to pick only one simulator which they consider their primary platform (regardless of simulator version). In this data we see that 70.8% of respondents picked Microsoft Flight Simulator as their primary platform, followed by X-Plane (13.1%), Prepar3D (4.6%), Infinite Flight (4.4%) and DCS World (3.2%).

4.3.2. Graphics Cards

In 3.5.5. we observed the Nvidia GeForce RTX 4090 claiming top status among flight sim users, now owned by 14.5%. Last year, it constituted 1.9% of the 82.4% who owned an Nvidia graphics card.

This surge signifies more than a tech preference; it's a significant investment for many. Flight sim enthusiasts acknowledge the Nvidia GeForce RTX 4090's role in enhancing their virtual experience. The data doesn't just reflect shifting choices, it also mirrors a community dedicated to pushing technological boundaries.

4.3.3. MSFS 2024 Purchase Likelihood

In 2019, we asked about the purchase likelihood of MSFS 2020, in which 63% of the respondents were likely or very likely to replace their current simulator with MSFS 2020. In the 2020 survey we noted that not as many as predicted did eventually buy MSFS 2020 when it became available.

This year, we find that more than 73% of the respondents state that they are likely to purchase the new MSFS 2024 when it becomes available. Just like with MSFS 2020 we will be monitoring the purchase likelihood and will compare it with a follow up question in the next survey to see how many respondents that actually followed through on their statement to purchase the new simulator.

5. Future Work

Like last year, we are publishing the raw survey data for anyone who wishes to do a continued analysis of responses. Possible ideas for continued analysis could be for example correlation studies

We are also very interested to see what more can be done in the area of AI on the free text responses. In particular, classification and clustering, and suppressing spurious data is quite interesting, we think. We did not succeed in extracting X-Plane and Prepar3D aircraft addon names from free text for example.

If you decide to download the data and want to share any of your analyses, please post them on social media using #flightsimsurveyanalysis and we will be happy to repost them.