

The logo for AVICO features the word 'AVICO' in a bold, sans-serif font. The 'A' is green, while 'VICO' is black. The letter 'O' is replaced by a green drone icon with four propellers. The background of the cover features a silhouette of a hand holding a drone against a bright, sunlit sky, with a bridge visible in the blurred background.

CODING TRAINING WITH AVIATION TECHNOLOGIES

Transnational Report



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Introduction

The AVICO project, which involves six countries—Turkey, Croatia, Italy, Serbia, Slovakia, and Portugal—focuses on integrating coding education with Unmanned Aerial Vehicle (UAV) technologies. This transnational report consolidates the findings from each participating country, providing a comprehensive view of the state of UAV and coding education in vocational training across these nations. By combining insights from expert interviews and student surveys, the report aims to identify the key challenges and opportunities within this growing field, offering practical recommendations to enhance educational programs.

UAV technologies are rapidly transforming various industries, from agriculture and logistics to environmental monitoring and urban planning. As these technologies become more integrated into daily operations, there is a growing demand for skilled professionals who not only understand how UAVs work but also have the coding and technical knowledge to innovate with them. Coding education, therefore, plays a crucial role in preparing students for the future workforce, especially in the context of aviation technologies, where the need for both technical and problem-solving skills is ever-increasing.

The AVICO project aims to explore how the combination of coding training and UAV education can better equip students for the future. This report examines the current state of this educational integration, offering a snapshot of the knowledge and experiences of students, the effectiveness of existing teaching methods, and the perspectives of experts in the field. The findings highlight both the successes and challenges faced by educational institutions across the five participating countries, offering a range of insights that can help improve training programs in UAV technology and coding.

Each participating country brings its own educational traditions, technological contexts, and industry relationships to the project. By drawing from national reports, the AVICO project provides a comparative analysis of how coding and UAV education are structured across different vocational settings. The report emphasizes the importance of understanding not only the technical skills needed for success in UAV-related careers but also the pedagogical approaches that best support students' learning and engagement.

In addition to exploring student knowledge and experience, the AVICO project also investigates the broader educational landscape, including industry trends, curriculum development, and collaboration between educational institutions and the private sector. By addressing both the educational and industry perspectives, the report provides a well-rounded view of the current state of UAV technology and coding education, while offering actionable recommendations for improvement.

The insights presented in this report aim to assist policymakers, educators, and industry professionals in creating more effective and relevant training programs. These programs are crucial for ensuring that students are not only prepared for the rapidly evolving technological landscape but also equipped with the skills to thrive in an increasingly automated and digital world.

The structure of the report is as follows: it begins with a detailed methodology section, followed by an analysis of the expert interviews and student surveys. The report concludes with recommendations aimed at improving educational practices and better aligning them



with the needs of both the students and the evolving job market.

1. Methodology

The methodology used in this transnational report is a combination of qualitative and quantitative research, involving expert interviews and student surveys across five participating countries: Turkey, Croatia, Serbia, Slovakia, and Portugal. This mixed-methods approach was chosen to ensure a comprehensive understanding of the current state of coding education with a specific focus on UAV (unmanned aerial vehicle) technologies. The goal was to gather in-depth insights into the challenges, opportunities, and emerging trends in UAV technology and coding education within vocational settings, as well as to examine the perspectives of both students and educators. The data collected served as a foundation for developing recommendations aimed at improving education and training in this evolving field.

The data collection process was structured and organized in the following manner:

- Expert interview
- Student survey

1.1 Expert Interviews

A key component of this research was conducting interviews with a diverse group of experts in the fields of UAV technology, coding, and vocational education. These experts were selected from various sectors, including academia, industry, and education policy, to ensure a wide range of perspectives on the integration of UAV technologies into vocational education. The interviews were designed to explore the practical challenges and opportunities of incorporating UAV technologies into existing educational frameworks, the necessary skills students need to succeed, and the role of industry collaboration in shaping training programs.

The expert interviews were semi-structured, allowing for flexibility in addressing a variety of topics while ensuring that key themes related to UAV technologies, coding education, and future skill demands were covered. The expert insights provided invaluable information on the state of current practices in UAV education, highlighting areas where educational systems may be falling short and suggesting areas for improvement. Additionally, experts provided valuable input on the skills gap in the UAV industry, helping to contextualize the educational needs of students in relation to industry demands.

A total of 84 expert interviews were conducted across all six participating countries. However, due to varying levels of engagement and logistical constraints, the KPI (20 per country) was not achieved fully. Despite this, the overall number of interviews conducted was substantial, averaging 18 per country. The data collected from these interviews provides a robust foundation for analysis and offers valuable insights into the perspectives of experts in the field.

1.2 Student Surveys

In parallel with the expert interviews, a comprehensive student survey was developed to capture the perspectives of students involved in UAV technology and coding education. The



survey was designed to assess several key aspects of the students' educational experiences, including their self-reported knowledge and skills in UAV technologies and coding, their preferences for learning methods, and the barriers they face in acquiring these skills. This survey also sought to understand students' views on the relevance and effectiveness of the training programs they were enrolled in.

The survey was distributed across the five countries, with participation from students in various types of educational institutions, including vocational secondary schools, higher education institutions, and informal education centers. The goal was to ensure a broad representation of student experiences. Questions ranged from knowledge and experience with UAV technology and programming languages to preferences for learning methods (such as video lessons, interactive applications, or project-based learning). The survey also aimed to identify key obstacles students faced in their education, such as lack of access to resources, limited practice opportunities, and insufficient instructional materials.

The project set an initial target of collecting at least 70 completed surveys from each participating country. While this objective was not uniformly achieved across all countries due to variations in institutional capacity and response rates, overall participation remained strong. On average, 68 surveys were completed per country, closely approaching the intended target. This robust level of engagement ensures that the survey results are representative and provide insights into the experiences and perspectives of VET students.

1.3 Data Analysis

Once the data was collected through both the expert interviews and student surveys, a thorough analysis was conducted to identify common themes, patterns, and key insights. The qualitative data from the expert interviews were coded and analyzed for recurring trends, challenges, and recommendations. The responses were categorized into themes related to curriculum development, teaching methodologies, student engagement, and the integration of new technologies in education.

The quantitative data from the student surveys were analyzed using descriptive statistics to identify trends and patterns in student knowledge, learning preferences, and perceived challenges. A comparative analysis across the five countries was then conducted to highlight both similarities and differences in educational approaches, barriers faced by students, and the perceived effectiveness of current training programs.

The comparative analysis not only provided insights into the effectiveness of existing UAV and coding education programs but also helped identify best practices that could be shared across the participating countries. By integrating the findings from both expert and student data, the methodology ensured a comprehensive understanding of the current state of UAV and coding education in vocational settings.

The combined analysis of expert insights and student feedback was crucial in formulating recommendations for the improvement of educational frameworks in UAV and coding. These recommendations are designed to help educators, policymakers, and industry leaders develop more effective training programs that align with the needs of the students and the industry, ensuring that future graduates are equipped with the necessary skills to succeed in the rapidly evolving world of UAV technology.



2. Data Analysis

The data analysis of this transnational report is divided into two primary components: Expert Interviews and Student Surveys. These components were analyzed separately to gain insights from both educational professionals and students. Subsequently, the findings from each component were cross-examined to identify overarching themes, common trends, and key conclusions that are relevant to the broader goals of the AVICO project. This analysis allows for a comprehensive understanding of the state of UAV and coding education across the five countries and provides a basis for making recommendations aimed at improving the quality of vocational training programs.

2.1 Expert Interviews

The expert interviews were a critical source of qualitative data, providing in-depth insights into the challenges and opportunities associated with integrating UAV technologies into vocational education. These interviews were conducted with professionals from various sectors, including academia, industry, and vocational training institutions, who offered valuable perspectives on the evolving landscape of UAV education.

2.1.1 Expert Profiles and Professional Backgrounds

The experts interviewed in this study were carefully selected based on their extensive experience in UAV technologies, coding education, and vocational training. The selection included professionals from a wide range of backgrounds:

- **Higher education institutions:** University professors and researchers specializing in engineering, aviation, and computer science, particularly those involved in developing or delivering UAV-related courses.
- **Vocational training centers:** Educators and trainers from institutions offering specialized courses in UAV technology, coding, and related fields.
- **Technology companies:** Professionals from the UAV industry, including those involved in the design and manufacturing of UAV systems, as well as those working in the application of UAV technologies across various industries (e.g., agriculture, logistics, surveillance).

These experts brought diverse perspectives, reflecting both the academic and industrial sides of UAV education. Their backgrounds ranged from theoretical and research-focused to practical and industry-driven, which enriched the breadth of insights gathered.

2.1.2 Key Topics Discussed

The expert interviews covered a wide array of critical topics that are central to the integration of UAV technologies and coding education within vocational training programs. The main topics discussed included:

- **Integration of UAV Technologies in Vocational Education:** Experts highlighted the importance of incorporating UAV technologies into vocational education to better prepare students for future workforce needs. This includes introducing UAV-related curricula at

various levels of education and ensuring that students have access to relevant tools and technologies.

- **Effectiveness of Current Educational Methods:** There was a thorough examination of existing educational practices used in teaching coding and UAV-related skills. Experts discussed the strengths and weaknesses of current methods, with a particular focus on how these methods align with the practical demands of the UAV industry.
- **Challenges in Keeping Up with Technological Advancements:** Experts emphasized the rapid evolution of UAV technologies, pointing out the difficulties educators face in staying up-to-date with new developments. This challenge includes not only updating curricula but also ensuring that educators have the necessary skills and resources to teach emerging technologies.
- **Industry-Ready Skills:** A recurring theme was the growing demand from the UAV industry for graduates with practical, industry-relevant skills. Experts discussed the gap between theoretical knowledge and the practical skills required by employers in the field of UAV technology, emphasizing the need for vocational programs to align closely with industry standards.
- **Recommendations for Improving Educational Practices:** Experts provided a range of suggestions for enhancing the integration of UAV technologies into vocational education. These included recommendations for curriculum updates, the adoption of new teaching methods, and increased collaboration with industry stakeholders.

2.1.3 Interviews Overview

The expert interviews were conducted using a semi-structured format, allowing for both guided and open-ended responses. This format encouraged rich, detailed conversations while ensuring that all relevant topics were addressed. A total of 77 experts were interviewed, representing all five participating countries in the AVICO project: Turkey, Croatia, Serbia, Slovakia, and Portugal.

Each interview lasted between 30 and 60 minutes and was conducted either in person or via video conferencing, depending on the availability of the experts. The semi-structured nature of the interviews allowed for flexibility, enabling experts to share insights beyond the predefined questions. Interviews were transcribed and analyzed to extract key themes and insights that were common across all countries.

2.1.4 Interviews Key Insights

The expert interviews yielded several key insights that provide valuable guidance for improving UAV and coding education in vocational settings:

- **Rapid Technological Change:** A consensus among experts was that UAV technology evolves at a rapid pace. Educational programs must adapt quickly to ensure that students are learning the most up-to-date skills and that the curriculum reflects current industry standards. Experts stressed the need for constant updates to training programs to avoid lagging behind technological advancements.
- **Hands-On Learning:** Many experts emphasized the importance of hands-on, experiential



learning when it comes to teaching UAV technologies and coding skills. They highlighted that students who actively engage with UAVs—whether by assembling, programming, or operating them—tend to retain skills more effectively. Practical experience is crucial to student engagement and long-term success in this field.

- **Interdisciplinary Approach:** Experts highlighted the necessity of a multidisciplinary approach in UAV education. Integrating coding, engineering, aviation, and data science into a single curriculum allows students to gain a comprehensive understanding of the field. This approach not only equips students with the technical skills needed for UAV operation but also fosters critical thinking and problem-solving abilities, which are essential for navigating complex industry challenges.
- **Industry Collaboration:** A significant recommendation was the strengthening of partnerships between educational institutions and the UAV industry. Experts stressed that collaboration with the private sector can ensure that training programs are aligned with the needs of employers. Industry partnerships can also provide students with opportunities for internships, apprenticeships, and real-world project experience, all of which are valuable for enhancing employability upon graduation.

2.1.5 Recommendations

Based on the insights gained from the expert interviews, several key recommendations were made to improve the integration of UAV technologies into vocational education:

- **Curriculum Updates:** Continuously updating curricula to incorporate the latest advancements in UAV technologies is critical. This includes ensuring that educational institutions have access to up-to-date hardware and software and that educators are trained on the latest tools and techniques used in the industry.
- **Industry Partnerships:** Strengthening collaboration with the UAV industry can help ensure that training programs are aligned with current industry needs. This includes the development of internship and work-placement opportunities that give students real-world exposure to UAV technologies.
- **Hands-On Training:** Increasing the use of practical, hands-on experiences is crucial for engaging students and enhancing their learning outcomes. Programs should prioritize project-based learning, where students can directly apply coding and UAV technologies in a real-world context.

By implementing these recommendations, educational institutions can better prepare students for careers in the UAV industry and ensure that graduates possess the necessary skills and knowledge to succeed in this rapidly growing field.

2.2 Student Surveys

The student surveys aimed to gather comprehensive data on the knowledge, experiences, preferences, and perspectives of students participating in UAV and coding education. The survey responses were analyzed to uncover trends in student profiles, their understanding of UAV technologies and coding, preferred learning methods, and the challenges they face in



these fields.

Additionally, the survey explored students' views on industry skills and future development opportunities.

2.2.1 Student Participant Profiles

The student survey collected responses from more than 350 students across the five participating countries: Turkey, Croatia, Serbia, Slovakia, and Portugal. These students were primarily aged between 16 and 18 years old, with a significant proportion of students being over 18. The majority of respondents were enrolled in vocational secondary schools, which are designed to prepare students for specific careers, including those in UAV technology and coding. However, there was a smaller percentage of students from informal education centers and higher education institutions, reflecting the broader interest in UAV and coding education.

2.2.2 UAV Technology and Coding Participants' Knowledge and Experience

Survey results revealed that the majority of students have a **basic to moderate understanding** of UAV technologies. When asked to assess their knowledge, the following responses were recorded (for the overall group of students):

- **36%** rated their knowledge as sufficient.
- **29%** rated it as good.
- **8%** considered it very good.

However, there was a significant gap in students' experience with programming. 88% of respondents reported having minimal to no programming experience. This indicates a considerable challenge in ensuring that students are adequately prepared for the coding aspect of UAV technology, which is a critical component of the field.

2.2.3 Educational Methods and Pedagogy Preferences

The survey also explored students' preferences for **educational methods**. The results showed a strong inclination toward **interactive and digital learning tools**, suggesting that students are looking for engaging and modern ways to learn:

- **37%** preferred video lessons.
- **31%** favored group studies.
- **23%** were drawn to interactive applications.

These findings underscore the students' desire for a **blended learning approach** that incorporates both theoretical knowledge and practical, hands-on experiences, with a clear focus on digital methods.

2.2.4 Industry Perspective and Future Skills

When asked about the skills they believe are most important for future careers, students identified a range of abilities that reflect current industry demands:

- **49%** identified problem-solving as the key skill.



- 28% emphasized technical skills.
- 12% prioritized teamwork.
- 10% highlighted creativity and innovation.

The high emphasis on **problem-solving** and **technical skills** aligns well with the needs of the **UAV and coding industries**, where employees are expected to navigate complex challenges and apply technical knowledge in real-world settings.

2.2.5 Obstacles and Solution Suggestions

The survey also captured insights into the **obstacles** students face in learning UAV technologies and coding. The following challenges were identified as the most significant:

- 42% cited a lack of suitable practice opportunities.
- 36% pointed out a lack of relevant resources.
- 18% found some concepts difficult to understand.

When asked for suggestions on how to address these challenges, students provided the following solutions:

- 40% suggested more student-centered learning materials.
- 30% recommended more interactive lessons.
- 25% advocated for increased practical activities.

These responses highlight a strong desire for more **practical and engaging learning experiences**, which could help students better connect with the material and overcome the obstacles they face in their studies.

2.2.6 Personal Development and Continuous Learning

Finally, the survey explored students' interest in **personal development** and **continuous learning**. A majority of respondents (around 65%) expressed a strong interest in **simulation-based training** as a means to further develop their skills outside of the classroom. This reflects a growing desire for **ongoing engagement and skill enhancement**, with many students looking for opportunities to continue learning after their formal education.

This finding suggests that there is significant potential for **e-learning platforms** and **simulation-based training** to play a larger role in students' ongoing professional development, allowing them to stay up-to-date with the latest UAV technologies and coding advancements.

3. Recommendations

Based on the findings from both the expert interviews and student surveys, several key recommendations are proposed for improving UAV technology and coding education in vocational training programs. These recommendations aim to address the identified challenges and capitalize on the opportunities for growth and improvement in this rapidly evolving field. The recommendations are designed to help shape the future of UAV education by focusing on continuous curriculum improvement, hands-on learning, industry



collaboration, resource accessibility, diversity, and student-centered learning.

3.1 Curriculum and Training Program Updates

- **Continuous Curriculum Updates:** It is essential to continuously update curricula to keep pace with the fast-evolving UAV technology. This includes integrating new technological advancements and industry trends into educational programs, ensuring that students are learning the most up-to-date skills. This should be done on a regular basis, involving input from both industry experts and academic professionals to ensure that what is taught in the classroom reflects real-world technological needs.
- **Multidisciplinary Approach:** The curriculum should emphasize a holistic, interdisciplinary approach that combines UAV operation, coding, engineering, aviation, and even other fields like data analysis and artificial intelligence (AI). This will provide students with a comprehensive understanding of the technology and its diverse applications across various industries, ensuring that they are well-prepared for the challenges they will face in the workforce.
- **Focus on Problem-Solving Skills:** Curricula should include dedicated components that focus on problem-solving techniques. In addition to technical skills, students should be taught how to approach complex, real-world problems and apply critical thinking skills to solve them. This is especially important given the evolving nature of UAV technology, which often requires creative solutions to emerging issues.

3.2 Hands-On, Practical Learning Opportunities

- **Increased Hands-On Training:** As highlighted by both experts and students, hands-on experience is crucial for effective learning. Practical exercises, such as operating UAVs, building prototypes, and working on coding projects, should be incorporated into the curriculum. This will improve student engagement, retention, and skill development. Students should be given opportunities to work on real-world projects that simulate industry practices, which will better prepare them for the workforce.
- **Simulation-Based Learning:** Simulation tools, such as virtual reality (VR) and augmented reality (AR), should be integrated into training programs. These technologies can offer immersive learning experiences that simulate real-world UAV operations, providing students with valuable practice opportunities without the need for physical UAVs. Simulation-based learning could be particularly beneficial in areas where physical resources are limited or expensive to provide.

3.3 Industry Collaboration

- **Strengthening Industry Partnerships:** Increased collaboration between educational institutions and the UAV industry is critical for ensuring that training programs align with the needs of the job market. Industry partnerships can facilitate internships, work placements, and guest lectures from industry experts, giving students exposure to real-world applications of UAV technology. These partnerships could also include joint research projects or collaborative design efforts, where students can work on cutting-edge industry



problems.

- **Employer Input for Curriculum Design:** To better align educational content with industry requirements, employers should be involved in the curriculum development process. Their insights can help ensure that the skills taught in training programs match the competencies needed in the workplace. This collaboration can also provide a valuable feedback loop for educators to continuously improve teaching methods and course content.

3.4 Resource Accessibility and Infrastructure

- **Improving Resource Availability:** To overcome challenges related to access to learning materials and practice opportunities, efforts should be made to provide more online courses, interactive apps, and other educational resources that can be accessed remotely. This will allow students, especially those from underserved regions or remote locations, to benefit from high-quality learning materials. Moreover, these resources should be regularly updated to reflect the latest trends and technological advances.
- **Addressing Infrastructure Gaps:** Educational institutions should focus on upgrading their infrastructure to provide students with the necessary tools and technologies for learning. This includes ensuring that students have access to computers, coding software, internet connectivity, and physical UAV hardware. Improving infrastructure will create an environment where students can actively engage in the learning process without technological barriers hindering their development.

3.5 Encouraging Diversity and Inclusion

- **Targeted Outreach to Underrepresented Groups:** To ensure that UAV technology and coding education is accessible to a diverse group of students, efforts should be made to increase the participation of underrepresented groups, particularly women and minority groups. This can include targeted recruitment campaigns, mentorship programs, and scholarships aimed at these groups. Programs designed to highlight role models from diverse backgrounds can also inspire a broader range of students to pursue careers in UAV technology and coding.
- **Inclusive Teaching Practices:** Educators should adopt inclusive teaching practices that cater to students with diverse learning styles and backgrounds. This will help create an environment where all students can thrive and succeed in UAV technology and coding education. Adapting teaching methods to accommodate students with disabilities, varying levels of prior knowledge, and cultural differences can ensure that every student receives the support they need to excel.

3.6 Student-Centered Learning

- **Personalized Learning Paths:** To address the varying levels of prior knowledge and experience among students, personalized learning paths should be developed. This could involve offering beginner, intermediate, and advanced tracks in coding and UAV operation to ensure that all students receive the support they need. Offering individualized learning plans will enable students to progress at their own pace and ensure that no one is left



behind due to differing skill levels.

- **Active Learning Techniques:** Incorporating more interactive and engaging teaching methods, such as project-based learning, gamification, and collaborative projects, can increase student motivation and improve learning outcomes. These approaches allow students to apply their knowledge in real-world scenarios, fostering problem-solving and critical thinking skills. Project-based learning, in particular, is beneficial in promoting deeper understanding by involving students in the full cycle of problem-solving and creation.

3.7 Professional Development and Continuous Learning

- **Support for Ongoing Professional Development:** Educators should be encouraged to engage in continuous professional development to stay updated on the latest advancements in UAV technology and coding education. This can be achieved through workshops, conferences, and online courses focused on the latest trends and best practices in teaching these subjects. Teachers who are well-versed in current technologies will be better able to engage their students and teach them the most relevant skills.
- **Lifelong Learning Opportunities for Students:** To foster a culture of lifelong learning, students should be encouraged to pursue further education and training beyond their initial vocational programs. This can include online courses, certification programs, and Massive Open Online Courses (MOOCs), which provide flexible learning options for students as they progress in their careers. Lifelong learning will enable students to continue developing their skills and adapt to the rapidly changing technological landscape of the UAV industry.

4. Conclusion

The AVICO project has provided valuable insights into the current state of UAV technology and coding education across five countries. By analyzing expert interviews and student surveys, we have gathered key findings that highlight both the growing interest in UAV technologies and coding, as well as the significant challenges faced by educators and students in this rapidly evolving field. The findings underscore the need for a continuous evolution of educational approaches to meet the demands of this dynamic industry.

Through the diverse data collected, the project has revealed several crucial points of focus for educational institutions and policymakers alike. The rapid pace of technological change in the UAV sector demands that curricula remain flexible and adaptive, while practical training and hands-on learning are essential for student success. Industry collaboration and resource accessibility also emerged as key factors for ensuring that education keeps pace with technological advancements. Additionally, fostering diversity and inclusion within the field is imperative for creating a more equitable learning environment that offers opportunities for all students.

4.1 Key Findings

- **Curriculum Gaps and Technological Advancements:** One of the most critical challenges identified is the rapid evolution of UAV technologies, which necessitates constant updates



to curricula. Educational institutions must ensure that their programs reflect the latest technological developments to provide students with the skills they need to succeed in the workforce. This requires a proactive approach to curriculum development, with close attention paid to emerging trends, industry requirements, and technological innovations.

- **Hands-On Training and Simulation:** Both experts and students stressed the importance of hands-on learning experiences. Practical, real-world training is crucial for developing the technical skills needed to operate UAVs and work with related coding languages. Furthermore, the integration of simulation tools, such as virtual reality (VR) and augmented reality (AR), is essential for providing students with immersive, interactive experiences. These tools can supplement physical UAV operations and allow for experimentation in a safe, controlled environment, making it possible for students to practice scenarios that would be too costly or dangerous in a real-world setting.
- **Industry Collaboration:** Stronger partnerships between educational institutions and the UAV industry are key to bridging the gap between classroom education and real-world employment. Industry collaboration provides students with valuable exposure to current technologies, practices, and professional expectations. Through internships, work placements, and industry-led curriculum design, students can gain practical experience and a better understanding of how their academic knowledge applies in the workplace. Close collaboration with employers can also ensure that training programs remain aligned with the skills needed in the job market.
- **Student Demographics and Preferences:** The student survey revealed that the majority of students in vocational UAV programs are over the age of 18, with a preference for text-based programming languages and video lessons. This demographic preference highlights the importance of providing educational content that caters to adult learners who may have varying levels of prior experience and learning styles. Additionally, there was significant interest in simulation-based learning for both UAV technology and coding, reinforcing the need to integrate digital tools into the curriculum that can enhance the learning experience and offer flexible, engaging modes of instruction.
- **Diversity and Inclusion:** A significant finding from this research is the need to increase diversity and inclusion within UAV technology and coding education. Efforts should be made to encourage the participation of underrepresented groups, particularly women and minority groups, in these fields. This can be achieved through targeted outreach campaigns, mentorship opportunities, and scholarships. Furthermore, inclusive teaching practices should be adopted to accommodate students from diverse backgrounds and with varying levels of prior knowledge, ensuring that all students have an equal opportunity to succeed.

4.2 Recommendations for Improvement:

The recommendations provided in this report aim to address the challenges and opportunities identified in the findings. Key recommendations include:

- **Curriculum Enhancements:** Regular updates to the curriculum are necessary to keep pace with technological advancements. The curriculum should adopt a multidisciplinary approach, incorporating coding, UAV operation, and related fields such as engineering and



data science, to provide students with a broad skill set.

- **Expanded Hands-On Learning:** More opportunities for hands-on training should be incorporated into programs, including practical exercises with UAVs, prototyping, and coding projects. The integration of simulation tools like VR and AR will further enhance learning opportunities.
- **Strengthened Industry Partnerships:** Developing stronger ties with industry stakeholders will ensure that training programs meet market demands. Educational institutions should work with employers to design curricula that reflect the skills required in the UAV industry and offer students real-world exposure through internships and placements.
- **Resource Accessibility:** Educational institutions should expand access to learning resources, such as online courses and interactive applications. Additionally, schools should invest in improving their infrastructure to ensure students have access to the necessary hardware, software, and internet connectivity.
- **Promotion of Diversity and Inclusion:** Initiatives to recruit underrepresented groups, particularly women and minorities, should be prioritized. Schools should also adopt inclusive teaching practices that support students with diverse learning needs, ensuring a welcoming environment for all.
- **Support for Lifelong Learning:** Students should be encouraged to engage in lifelong learning through continuous education and certification programs. This will help them stay competitive in the rapidly changing UAV industry.

4.3 Moving Forward

The findings of this report demonstrate the vast potential for the growth of UAV technology and coding education. However, there remains work to be done to address the gaps in curriculum design, infrastructure, and access to resources. By implementing the recommended improvements, educational programs will be better equipped to meet the evolving needs of the industry and provide students with the skills required for success in the workforce.

Moving forward, the focus should be on creating a more engaging, inclusive, and future-ready educational environment. This can be achieved through continuous curriculum updates, the integration of new technologies such as VR and AR, stronger collaborations with industry, and increased efforts to ensure that education is accessible to all students, regardless of their background. The future of UAV education looks promising, and with the right steps taken, it can play a pivotal role in shaping the future workforce in the UAV and coding industries.