

Ye. Misko

*Research supervisor: O. Mosiuk,
PhD in Pedagogical Sciences, Associate Professor
Zhytomyr Ivan Franko State University*

*Language tutor: T. Lytniova,
PhD in Pedagogical Sciences, Associate Professor*

ANALYSIS OF MODERN EDUCATIONAL TOOLS FOR TRAINING STUDENTS TO FLY DRONES

Introduction. Drone technology holds immense potential for revolutionizing education across various disciplines, from STEM fields to geography and environmental studies [1]. Training students in safe and responsible drone piloting equips them with valuable skills applicable in future careers and fosters innovation. This paper analyzes the modern educational tools available for training students to fly drones, highlighting their unique contributions to the learning process.

Drone Simulators (Tab. 1). Drone simulators provide a safe and controlled environment for students to learn the fundamentals of drone operation. They offer realistic flight dynamics, customizable control layouts mirroring various drone models, and gamified learning experiences with missions and challenges. Popular options like STEMPilot and AeroSIM RC cater specifically to educational settings, often integrating with existing STEM curriculum. These simulators allow students to practice maneuvers, develop spatial awareness, and experience potential risks without damaging real drones.

Table 1

Strengths and weaknesses of drone simulators

Strengths	Weaknesses
Safety: Eliminates the risk of crashes and injuries associated with real-world drone piloting.	Limited Haptic Feedback: Lacks the physical sensation of controlling a real drone.
Accessibility: Enables students to practice flight skills at any time and location.	Environmental Limitations: Cannot fully replicate real-world weather conditions and air resistance.
Affordability: Simulator software can be significantly cheaper than purchasing and maintaining physical drones.	
Customization: Allows tailoring the learning experience to different ages and skill levels.	

Flight Planning Software (Tab. 2). Flight planning software equips students with

the skills for safe and responsible drone operation in real-world scenarios. Platforms like DJI Pilot and DroneDeploy offer features for pre-flight planning, including airspace restrictions, obstacle identification, and autonomous flight path creation. Students can learn to create flight plans that optimize data collection or image capture while adhering to regulations.

Table 2

Strengths and weaknesses of Flight Planning Software

Strengths	Weaknesses
Safety Enhancement: Promotes responsible drone usage by fostering awareness of airspace regulations.	Software Specificity: May require learning software specific to particular drone models.
Safety Enhancement: Promotes responsible drone usage by fostering awareness of airspace regulations.	Limited Hands-on Experience: Doesn't replace the need for practical flight training.
Mission Planning: Teaches students to plan efficient and effective drone flights for specific tasks.	
Data Integration: Can integrate with data analysis platforms for a seamless workflow.	

Conclusion. Modern educational tools offer a powerful combination for training students to fly drones. Teachers can use the necessary software to design unique piloted tasks that will develop students' piloting skills and knowledge.

Future research might include the study of virtual reality simulators, the use of artificial intelligence for autonomous drone control training, and cloud-based data analysis platforms accessible from anywhere.

REFERENCE

1. Wing Shui Ng, Gary Cheng Integrating Drone Technology in STEM Education: A Case Study to Assess Teachers' Readiness and Training Needs. *Issues in Informing Science and Information Technology*, 16, 2019. p. 61 – 70. DOI: <https://doi.org/10.28945/4288>