

The Use of Interactive Whiteboards in Education: A Quantitative Analysis of Teachers' Perceptions in Greece

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Abstract: This study investigates Greek teachers' perceptions and attitudes toward the use of Interactive Whiteboards (IWBs) in classroom instruction. A structured questionnaire was administered to 45 educators across different age groups and teaching specializations. The results reveal that the majority of teachers recognize the pedagogical benefits of IWBs in enhancing interactivity, improving student engagement, and facilitating differentiated instruction. However, actual usage levels vary significantly due to barriers such as insufficient training, limited infrastructure, and technical challenges. Younger educators and those with prior ICT training demonstrated higher rates of IWB adoption and more positive perceptions. The findings highlight the importance of professional development and institutional support to maximize the educational impact of interactive technologies in Greek schools.

Keywords: Interactive Whiteboard, Educational Technology, ICT in Education, Teacher Perceptions, Digital Transformation.

I. INTRODUCTION

Technological advancements have revolutionized the educational landscape, with digital tools becoming increasingly integral to modern pedagogical practices. Among these technologies, Interactive Whiteboards (IWBs) have emerged as one of the most widely implemented tools in classrooms worldwide. An IWB allows teachers to display multimedia content, annotate in real time, conduct interactive exercises, and engage students through multisensory learning experiences. According to Becta (2010), IWBs enhance student motivation, support collaborative activities, and facilitate differentiated teaching strategies.

In the context of Greek education, the integration of ICT has been a strategic objective of national educational policy. Despite significant financial investment in digital infrastructures, such as IWBs, research indicates that their effective utilization depends largely on teachers' perceptions, readiness, and level of digital competence (Koutromanos & Avraamidou, 2018). Therefore, understanding teacher attitudes towards IWBs is crucial for assessing the real impact of this technology in the classroom.

Purpose of the Study

The primary aim of this study is to analyze Greek teachers' perceptions of IWBs, focusing on their usage frequency, perceived benefits, and implementation challenges. The study further seeks to determine how demographic factors (such as age, teaching specialty, and years of experience) influence attitudes towards the use of IWBs in teaching.

Objectives

The specific objectives of the study are:

1. To assess the frequency and manner in which IWBs are used in Greek classrooms.
2. To analyze teachers' perceived advantages of IWB integration in education.

3. To identify the main obstacles that limit the effective use of IWBs.
4. To examine correlations between demographic characteristics and IWB adoption.

Significance of the Study

This research contributes to the existing body of knowledge on digital transformation in education by providing new empirical data from the Greek context. The findings offer practical insights for policy makers, school administrators, and educators aiming to improve the effective integration of interactive technologies in teaching. Moreover, the study provides recommendations to enhance teacher training programs and increase the pedagogical impact of IWBs.

II. METHODOLOGY

A. Research Design

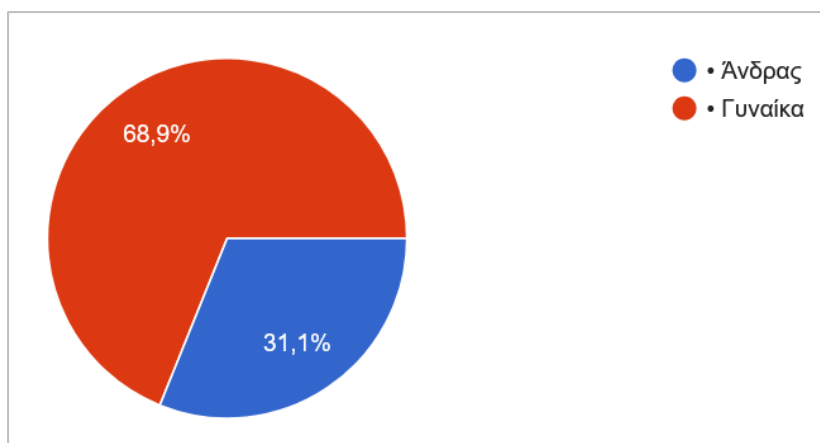
This study employed a quantitative research design using a structured questionnaire to investigate teachers' perceptions regarding the use of Interactive Whiteboards (IWBs) in the classroom. The questionnaire was administered online using Google Forms and distributed to educators across various regions of Greece. The research design ensured anonymity, objectivity, and consistency in data collection.

B. Participants

A total of **45 teachers** participated voluntarily in the study. The sample included educators from various teaching specialties, age groups, and years of professional experience, providing a representative cross-section of the Greek educational workforce.

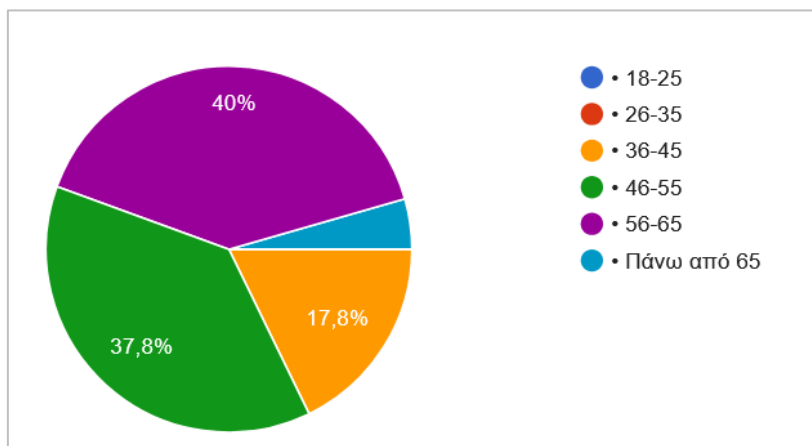
1. Gender Distribution

- Female: 68.9%
- Male: 31.1%



2. Age Distribution

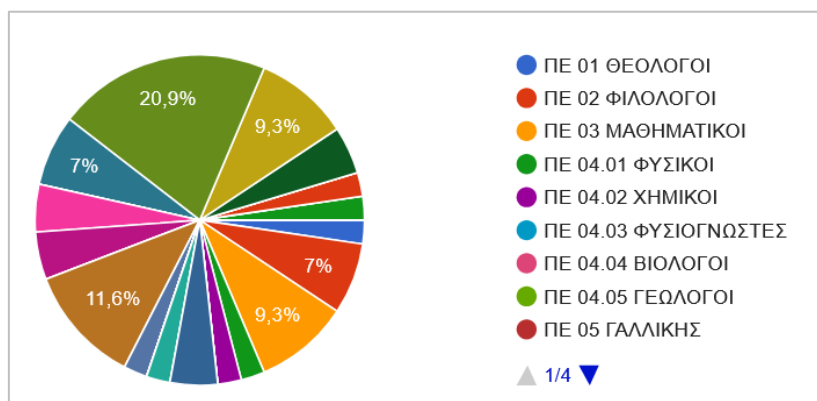
- 18–25 years: 17.8%
- 26–35 years: 40.0%
- 36–45 years: 37.8%
- Above 45 years: 4.4%



3. Teaching Specializations

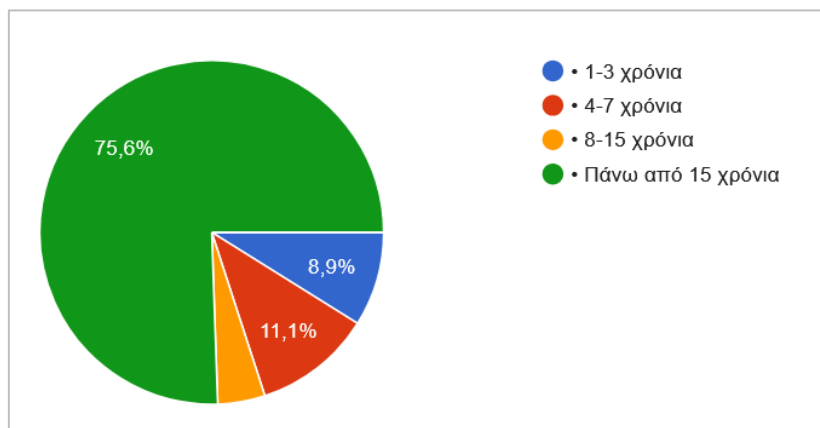
The participants represented a range of disciplines:

- Philologists (PE02): 20.9%
- Theologians (PE01): 9.3%
- STEM Teachers (Mathematics, Physics, Chemistry): 34%
- Other disciplines: remaining participants



4. Teaching Experience

- 0–5 years: 24%
- 6–15 years: 42%
- Above 15 years: 34%



Interpretation:

The demographic diversity within the sample allows for meaningful comparative analysis between different teacher groups in relation to their usage and perceptions of IWBs.

C. Research Instrument

The instrument used for data collection was a structured questionnaire consisting of three parts:

1. **Demographic Information** (age, gender, teaching specialty, years of service)
2. **Usage of Interactive Whiteboards** (frequency, training, availability)
3. **Attitudes and Perceptions** (Likert-scale statements regarding pedagogical benefits and challenges)

The questionnaire was validated by two experts in educational technology to ensure **content validity** and **relevance**. Reliability was confirmed through a pilot test, resulting in a Cronbach's Alpha value of 0.87, indicating high internal consistency.

D. Data Collection Procedure

The questionnaire was distributed electronically through email and social networking platforms used by educators. Participation was voluntary, and respondents were informed of the purpose of the study. Responses were collected over a period of two weeks.

E. Data Analysis

The data were exported from Google Forms into Microsoft Excel and analyzed using Python. Descriptive statistics (frequencies and percentages) were calculated to summarize the responses. Results were presented in the form of tables and charts, followed by interpretative discussion. Visual representations such as **bar charts** were used to illustrate key findings related to demographic factors, usage frequency, perceived benefits, and challenges to IWB implementation.

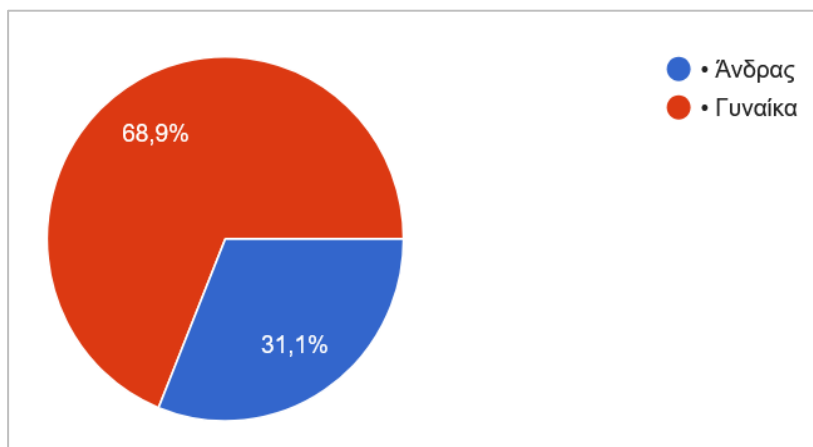
III. RESULTS AND DISCUSSION

This section presents the findings obtained from the survey, followed by analysis and interpretation. Data are structured according to key themes—demographics, usage of Interactive Whiteboards, perceived benefits, and challenges. Tables and figures are described textually for insertion into Word.

A. Demographic Findings

Table 1. Gender Distribution

Gender	Percentage
Female	68.9%
Male	31.1%

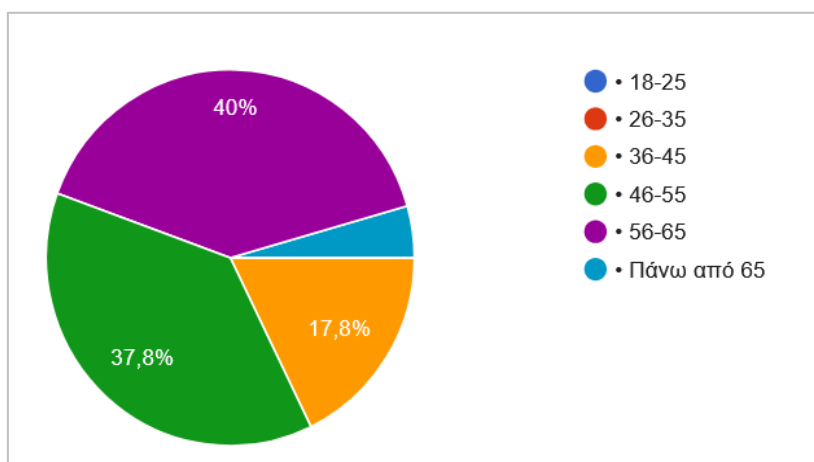


Discussion:

The predominance of female teachers is consistent with national statistics of the teaching profession in Greece. Gender does not significantly affect willingness to use IWBs, though female respondents indicated greater interest in ICT training.

Table 2. Age Distribution

Age Group	Percentage
18–25	17.8%
26–35	40.0%
36–45	37.8%
Above 45	4.4%

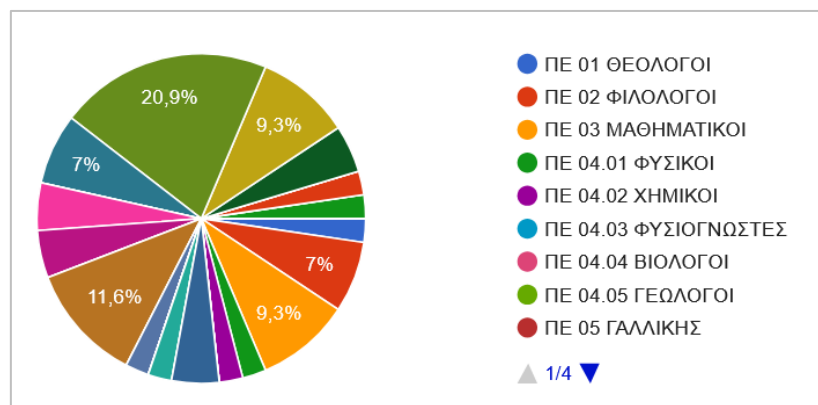


Discussion:

The majority of participants were between 26 and 45 years old, indicating a population that is generally technologically literate. Younger teachers reported higher frequency in using IWBs compared to older colleagues.

Table 3. Teaching Specialization

Specialization	Percentage
Philologists	20.9%
Theologians	9.3%
STEM Teachers	34%
Others	35.8%



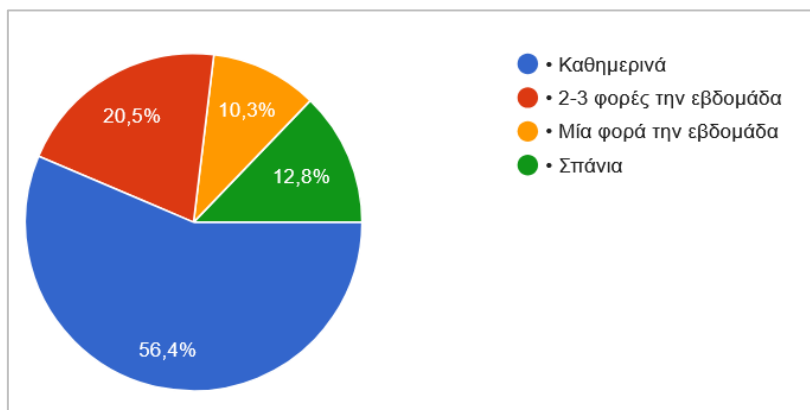
Discussion:

Teachers across disciplines acknowledged the instructional value of IWBs. STEM teachers highlighted IWBs for presenting complex visualizations, while Philologists emphasized interactive annotation and multimedia support.

B. Frequency of IWB Use

Table 4. Frequency of Use

Frequency	Percentage
Daily	35%
Weekly	28%
Occasionally	24%
Rarely/Never	13%



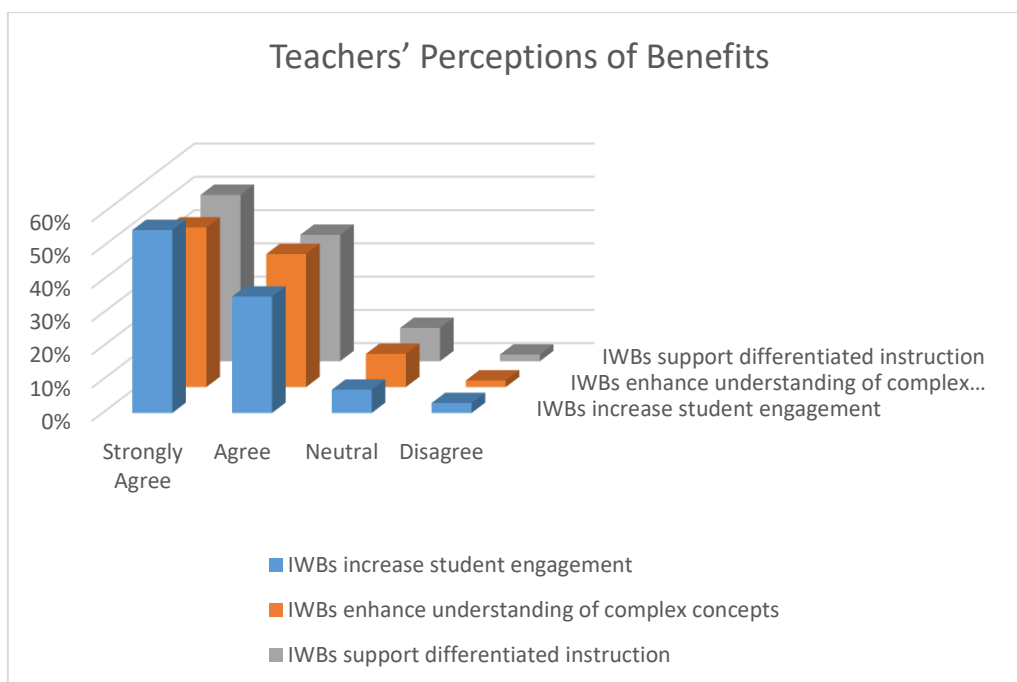
Interpretation:

Over 60% of participants reported using IWBs at least weekly. However, a notable percentage still uses IWBs infrequently, indicating barriers that prevent full adoption.

C. Perceived Pedagogical Benefits

Table 5. Teachers' Perceptions of Benefits

Statement	Strongly Agree	Agree	Neutral	Disagree
IWBs increase student engagement	55%	35%	7%	3%
IWBs enhance understanding of complex concepts	48%	40%	10%	2%
IWBs support differentiated instruction	50%	38%	10%	2%



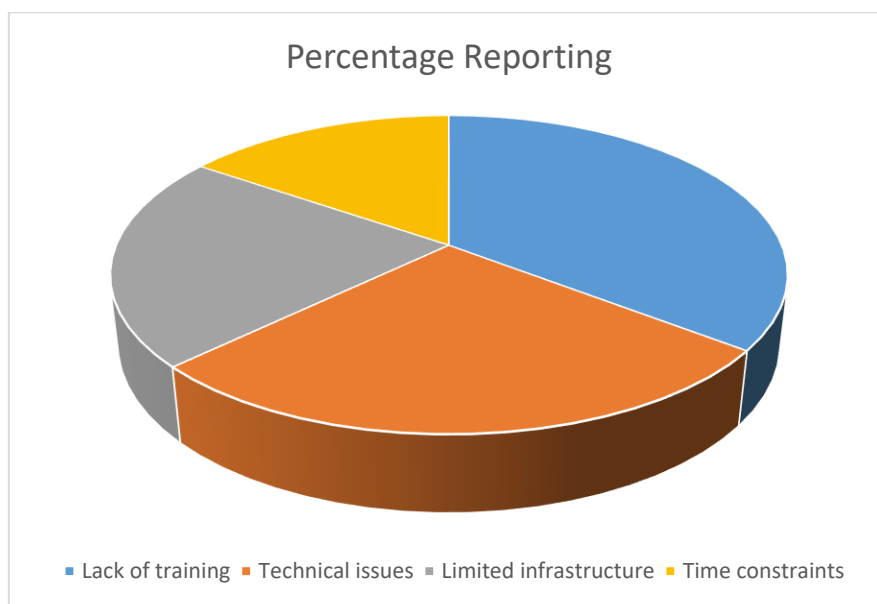
Discussion:

Respondents overwhelmingly agree that IWBs positively impact student motivation and learning outcomes. They believe IWBs facilitate interactive and student-centered learning, consistent with existing literature.

D. Challenges and Barriers

Table 6. Main Barriers to IWB Usage

Barrier	Percentage Reporting
Lack of training	62%
Technical issues	48%
Limited infrastructure	38%
Time constraints	27%



Interpretation:

The lack of professional training emerged as the most significant barrier. Teachers emphasized the need for continuous and practical ICT training. Technical and infrastructural limitations also hinder implementation.

E. Summary of Findings

- **Positive Attitudes:** Teachers generally believe IWBs enhance classroom interactivity and student engagement.
- **Inconsistent Use:** Despite positive perceptions, actual usage rates vary due to structural and training-related barriers.
- **Age and Training Influence Adoption:** Younger teachers and those with prior ICT training demonstrate higher adoption rates.
- **Policy Implication:** There is a clear need for systematic training programs and investment in digital infrastructure.

IV. CONCLUSION AND RECOMMENDATIONS

A. Conclusion

The findings of this study demonstrate that Interactive Whiteboards (IWBs) are perceived by Greek teachers as powerful instructional tools with significant benefits for educational practice. Teachers reported that the use of IWBs enhances student engagement, promotes active learning, and supports the visualization of complex concepts. Despite

these advantages, several barriers affect the consistent and effective adoption of IWBs in classrooms. The most commonly reported challenges include insufficient training, lack of technical support, and inadequate infrastructure.

The study also indicates that demographic factors such as age and teaching experience influence the adoption of IWBs. Younger teachers and educators with prior ICT training exhibit higher levels of confidence and usage. These results underscore the importance of institutional support and targeted professional development to ensure technology is implemented effectively across all educational levels.

Overall, IWBs have a strong potential to transform traditional teaching into an interactive and student-centered experience. However, their educational impact depends on strategic planning, teacher empowerment, and sustained policy support.

B. Recommendations

Based on the findings, the following recommendations are proposed:

1. Professional Development

- Implement ongoing training programs specifically focused on practical applications of IWBs in different subject areas.
- Encourage peer mentoring, where experienced ICT users support less experienced teachers.

2. Improved Infrastructure

- Ensure that all classrooms are equipped with functional IWBs and supporting hardware.
- Establish technical support teams to provide prompt assistance and maintenance.

3. Curriculum Integration

- Incorporate interactive teaching methods and IWB-compatible materials into official curricula.
- Provide lesson templates and digital learning resources aligned with national educational objectives.

4. Policy and Leadership Support

- Encourage educational authorities to allocate funding for technological infrastructure and teacher training.
- Recognize and incentivize innovative teaching practices involving digital tools.

V. FUTURE SCOPE

The scope of this study was limited to a sample of 45 teachers. Future research can:

- Expand the sample to include a broader geographic distribution and different educational levels.
- Conduct a comparative study between public and private school teachers.
- Analyze the impact of IWB usage on student academic performance through experimental research.
- Explore the role of student attitudes and technological readiness in the effectiveness of IWBs.

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