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A COMPARATIVE EXPERIMENT ON THE EFFICIENCY OF BIM TECHNOLOGY ASSIMILATION IN ARCHITECTURAL EDUCATION

Abstract

BIM (Building Information Modelling) technologies are now an integral part of architectural design and construction, enabling the integration, automation, and optimization of processes in these fields. Mastery of BIM is a critical component of modern architectural education, necessitating the adoption of effective software tools and technologies that play a pivotal role in contemporary design and construction management. This study conducts a comparative analysis of the efficiency of two software products - Autodesk Revit and Graphisoft ArchiCAD - used at various stages of architectural project creation.

The primary goal of this research is to analyze the process of acquiring professional competencies through the study of BIM platforms. Based on an exploration of the functional features of BIM technologies in architectural design, the hypothesis is proposed that students mastering specific BIM platforms over equivalent periods and with similar learning intensity achieve comparable skill levels due to the shared workflows inherent in the creation of information models.

This paper presents an independent, comprehensive evaluation of BIM software, assessing user interface intuitiveness, modelling tool usability, project documentation creation, parametric modelling, interdisciplinary collaboration support, library accessibility, and application in architectural, landscape, and interior design. Additionally, the study introduces a universal adaptation criterion - a measure of the time required for students to master the basic functionalities of the software.

The conclusions summarize students' experiences with the study of BIM technologies in architecture, offering recommendations for the combined study of Graphisoft ArchiCAD and Autodesk Revit to foster comprehensive skill development. The findings aim to improve the quality of training for future architects and hold practical value for educational institutions in modernizing curricula. These insights may also guide software developers in refining their products to better address educational needs.

Keywords: BIM technologies; ArchiCAD; Revit; architectural education; training future architects.

1. Introduction: Description of the Research Problem

The modern development of architectural education is inseparable from the integration of digital technologies, particularly Building Information Modelling (BIM), which has become a foundation for the design, construction, and operation of buildings [1]. BIM technologies significantly enhance project quality, streamline processes, and reduce time and resource expenditures. However, a key challenge remains in selecting the most suitable software for diverse tasks in training future architects. Such software should enable the efficient assimilation of both practical and theoretical knowledge.

Among the most popular BIM tools for architects are Autodesk Revit and Graphisoft ArchiCAD [2]. Both programs offer extensive functionality and are applied in various contexts of architectural design. However, differences in their concepts, interfaces, and approaches to work present specific challenges for their integration into educational processes.

An equally important consideration is the complexity of mastering these programs for students, their ability to quickly adapt acquired knowledge to design tasks, and the adequacy of available tools to efficiently realize diverse ideas. Research on this issue is relevant because the appropriate choice of educational tools can significantly impact the quality of training future specialists, their competitiveness in the labour market, and their ability to work in interdisciplinary environments. A review of the literature reveals a lack of comprehensive and high-quality comparative analyses of various BIM programs, where respondents with equal skill levels in different software tools could independently evaluate BIM software functionality.

This study focuses on analysing the advantages and disadvantages of Autodesk Revit and Graphisoft ArchiCAD within the context of their application in architectural education. The findings will help determine which software better facilitates the development of students' professional competencies and enhances the efficiency of the educational process, depending on the tasks at hand.

The hypothesis of this study comprises two assumptions:

- Students who study specific BIM programs over an identical period of time achieve similar levels of proficiency due to shared algorithms inherent in the creation of information models.
- Design outcomes using Autodesk Revit are more suitable for interdisciplinary collaboration, as this software is the most widely used among architects and project managers globally.

The goal of this publication is to analyse and evaluate the effectiveness of using Autodesk Revit and Graphisoft ArchiCAD in teaching BIM technologies to

architecture students. The study aims to compare the educational efficiency of these two tools and assess their impact on the development of students' practical skills.

The object of this study encompasses the software products Autodesk Revit (versions 2024–2025) and Graphisoft ArchiCAD (versions 27–28). The subject of this study is the effectiveness of teaching BIM technologies to students of architectural faculties.

To achieve the stated goal, the following research objectives were formulated:

- *Conduct a comparative analysis and evaluate the effectiveness of BIM technology education in architectural studies.* This includes identifying the advantages and disadvantages of each platform at different stages of architectural project development, analyzing the intuitiveness of the interface and the convenience of modelling tools, assessing the capabilities for project documentation creation and parametric modelling, and examining the support for interdisciplinary collaboration as well as the availability of libraries for architectural, landscape, and interior design applications.
- *Analyze the process of acquiring professional competencies by students during their study of BIM platforms.* At this stage, the study aims to determine the skill levels of students who are learning BIM software over the same period and with equal intensity of training. It is essential to identify common work algorithms within the information modelling system that influence the level of material comprehension. Additionally, a universal criterion for assessing the time required for students to master the basic functions of the software is proposed.
- *Develop recommendations for educational institutions and software developers.* This involves creating guidelines for selecting and integrating software for teaching BIM technologies, suggesting ways to optimize educational programs focused on the practical application of BIM tools, and providing recommendations for software developers to enhance the functionality of their programs to facilitate learning for beginners.

The introduction of BIM standards into the regulatory framework of Ukraine is of critical importance in the context of the post-war recovery of the state [3] and the creation of conditions for high-quality architecture that takes into account all aspects of sustainable development of the living environment [4].

Based on the objectives of the study, the analyzed literature base is multidisciplinary and addresses issues in pedagogy related to the training of specialists in the architectural field [5–6], modern principles of teaching BIM technologies [7], and the specifics of applying various BIM technologies in the educational process [8–9].

In the scientific work *"The Impact of Augmented Reality on Architectural Education and Design Processes"* by Kharvari F. [10], an algorithm for conducting

sociological surveys among students is outlined, based on expert assessments of students after completing an educational course. In the context of this research, the study *"Serendipity and Control in Design Processes: An Empirical Study with Architecture Students"* by Belmonte, M.-V., is particularly relevant as it highlights methods for evaluating the qualitative indicators of material assimilation among students [11].

Another category of research involves determining the main criteria for evaluating BIM technologies and their usability in various fields of architectural activity. Regarding publications related to information modelling, it is necessary to mention the research conducted by the Building Smart organization. This organization unites scientists and practitioners in the field of architecture and is one of the centres for the development of BIM technologies in Europe. It conducts research and implements standards for creating information models in architecture and construction [12-13]. The scientific works of M. Kassem [14], M. Hamma-adama [15], M. Johansson [16], and A. Lesiak [17] constitute the informational basis of this work, as they highlight the methodology for studying BIM technologies in the training of future specialists and practical activities. Empirical studies using Autodesk Revit by M.B. Shishehgarkhaneh [18] and S. Jin [19] demonstrate the need for integration and cross-platform work on architectural projects in modern conditions. The research of Gao, X. and Pishdad-Bozorgi, P. [20], H. Khan and others addresses the in-depth settings and parameterization of Autodesk Revit and Graphisoft ArchiCAD in design. In their works, J. Moyano, A. Pili, J.E. Nieto-Julián, A. Ghaffarianhoseini, J. Tookey, and others define a number of unified characteristics inherent to all BIM programs. Research on the functional content and further development paths of BIM is presented in the works of Piroozfar, P., Farr, E.R.P., Zadeh, A.H.M., Inacio, S.T., and others.

In addition to Autodesk Revit, which is widely represented in scientific works as an exemplary platform working on information modelling principles, the scientific literature also includes studies where research on specific aspects of BIM is based on Graphisoft Archicad. Among contemporary Ukrainian scientists, research in the field of BIM has been conducted by Kravchenko, O., Khoruzhyi, V., L.V. Shumak, and O. Levchenko, A. Akopova, Ye.V. Novak, M. Surianinov, and others.

2. Materials and Methods

In this study, the effectiveness of mastering BIM technologies was tested using two educational platforms, Autodesk Revit and Graphisoft ArchiCAD. The choice of these platforms is due to their popularity in the architectural field and their widespread use in university curricula. The research was conducted at the Department of Architecture and Urban Planning of IFNTUOG during the autumn semester of the 2024-2025 academic year.

The target group of the study consisted of 12 students in their 5th semester of the "Architecture and Urban Planning" educational program at the Institute of Architecture, Construction, and Energy of Ivano-Frankivsk National Technical University of Oil and Gas, located in Ivano-Frankivsk. For objectivity, a group of students with basic skills in Autodesk Revit and Graphisoft ArchiCAD was selected.

Participants in the experiment, as part of the "BIM Technologies in Architecture" course, were given the task of creating an information model of a single-family residential house based on a reference and preparing the corresponding drawings and specifications for the design stage using Autodesk Revit. The group of students underwent a 30-hour video course on the basics of creating BIM models, working with different tools, and preparing project documentation. The video course was structured as a step-by-step system for completing the semester task assigned to the students. At the same time, students had skills in the Graphisoft ArchiCAD project environment, which they acquired in the semester preceding the study, allowing them to draw their own analogies between both programs during the learning process. Teaching was conducted according to the recommendations of Barison and Santos (2010) on integrating theoretical and practical components into higher education.

Based on the objectives of this study, the main data collection methods were:

- *survey*: Used to assess the subjective perception of the complexity of the compared software, interface convenience, and its applicability in architecture, landscape design, and interior design.
- *analysis of learning outcomes:* Evaluation of the projects completed by students based on criteria such as modelling accuracy, task completion time, and documentation quality in both programs.

The methods of data analysis and survey results were categorized into two types:

- *statistical analysis and data collection:* Conducted using the "Google Forms" service. Students were asked to rate from 1 to 5 a series of questions outlining the range of tasks they completed using different BIM platforms during the assignment, which is an interpretation of practical work.
- *effectiveness analysis based on average success rates in the group:* The research aimed to identify key factors affecting the effectiveness of learning BIM technologies and provide recommendations for their optimization in educational programs.

3. Comparative Analysis and Evaluation of BIM Platforms Among Students

Building Information Modelling (BIM) has become a key approach to design and construction. In the field of architectural education, BIM technologies deepen students' professional skills, foster the development of systemic thinking, and allow for quicker absorption of comprehensive knowledge about collaborative modeling and project management.

Autodesk Revit and Graphisoft Archicad are two popular BIM platforms used in modern design. They implement different approaches to project modelling and the organization of the work environment:

- *Autodesk Revit* focuses on supporting collaboration and allows a larger group of professionals to work on a single project simultaneously.
- *Graphisoft ArchiCAD* features an intuitive interface and powerful visualization tools, making it attractive to architects.

The key criteria for evaluating the potential of each BIM platform in the context of students' learning outcomes are based on an analysis of the following criteria:

- *Interface Convenience:* Level of navigation and user perception.
- *Library Accessibility:* Availability of ready-made components for quick model creation.
- *Quality and Speed of Project Documentation Creation:* Ability to create project specifications according to international standards.

To conduct a comparative evaluation of different BIM programs, the main lifecycle stages of a building should be highlighted. The MacLeamy curve, which is used to substantiate the advantages of BIM technologies, identifies the following phases of project activity: use of BIM in conceptual design, detailed design, creation of project documentation, estimation, construction management, and monitoring of system performance (Fig. 1).

The results of MacLeamy's research formed the basis for further scientific inquiries. In the scientific articles by U. Hettithanthri and P. Hansen, J.T. Hemdan, and others.

As part of the task performed by the studied group of students – "Sketch project of a single-family residential house based on a reference," some BIM management processes related to the building's maintenance after the completion of construction were not included in the course curriculum. Therefore, the 16 questions of the survey were grouped into 5 blocks, addressing the BIM software interface, 3D modelling process, 2D modelling process, related functionality (visualization, model libraries, cross-platform work convenience, etc.), and the application of this software in the architectural design of low-rise residential buildings, multi-story residential buildings, landscape architecture, and interior design. The survey results (Fig. 2) reflect the average ratings of all 12 students in the studied group after completing the semester

course "BIM Technologies in Architecture." The students' rating scale ranged from 1 (low rating) to 5 (high rating).

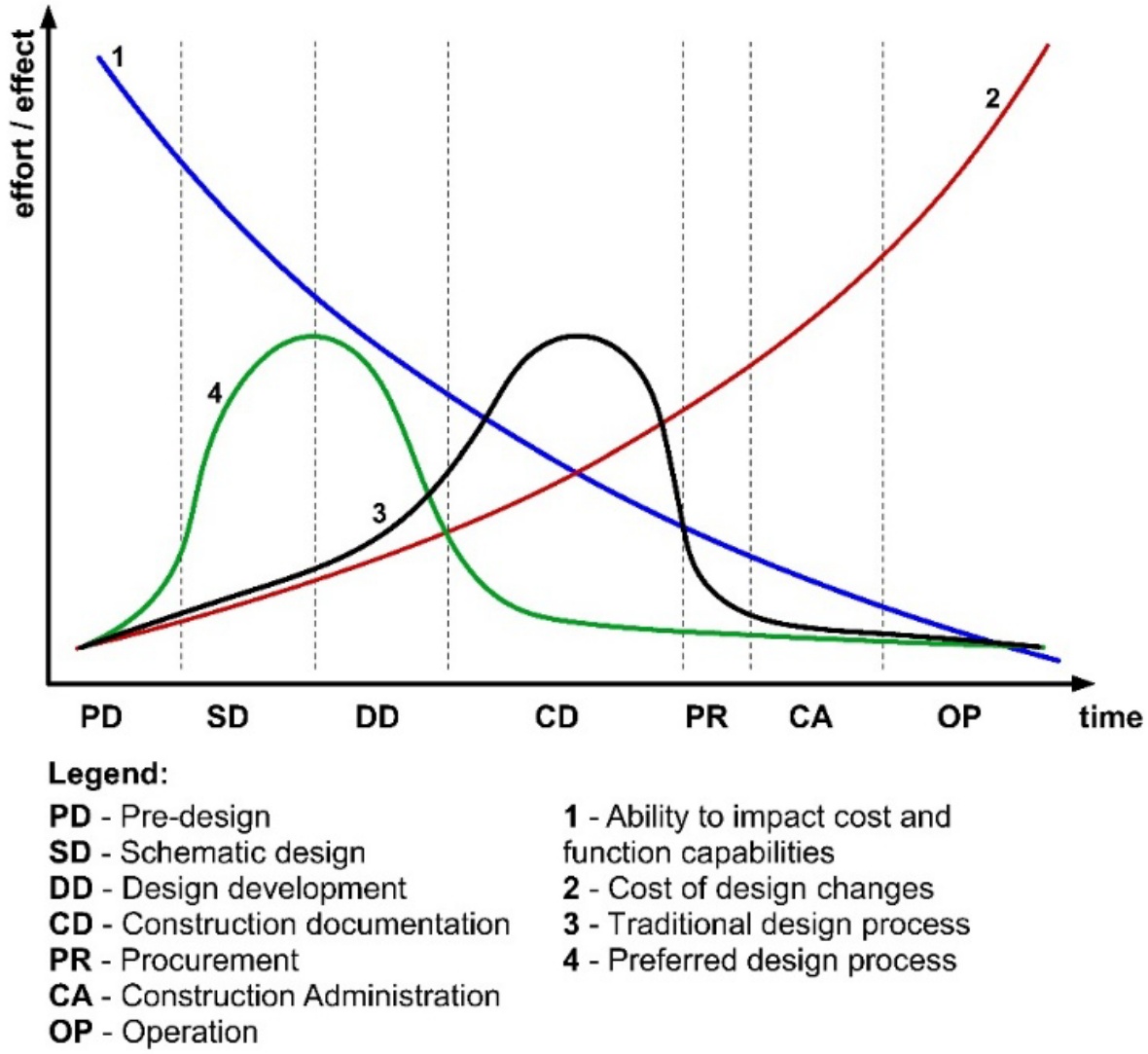

Figure 1 MacLeamy Curve

The analysis of the average evaluation results indicates that the ArchiCAD interface is easier for students to master compared to Revit, with $Ey_{1...2} / n_{1..2}$=3.96 versus $Ex_{1...2} / n_{1..2}$=3.5. Meanwhile, the capabilities for 3D modelling in Revit are considered more advanced by students, with $Ex_{3..4} / n_{3..4}$= 4.01 versus $Ey_{3..4} / n_{3..4}$= 3.67.

The analysis of the final block of questions demonstrates a preference among students for Autodesk Revit when modelling various types of architectural objects. However, due to the large number of model libraries integrated into the software structure, students prefer Graphisoft ArchiCAD for landscape design and interior design projects.

In the next stage of the study, a similar survey was conducted among professionals who actively use both BIM platforms in their practical work and have more than 5 years of experience with Revit and ArchiCAD (Fig. 3). The studied group of professionals from Ukraine also consisted of 12 individuals.

The comparative analysis of the evaluation results of the studied groups of students (k_1) and industry professionals (k_2) demonstrates a similar trend in responses to individual questions. However, the average values of the 5 blocks of questions indicate significantly higher ratings for both compared BIM software among industry professionals.

The difference in average ratings across blocks for students is k_2-$k_{1st.}$=0.096 in favor of Graphisoft ArchiCAD, compared to k_1-$k_{2prof.}$=0.052 in favor of Autodesk Revit among professionals.

$$\frac{\sum x}{n_x} - \frac{\sum y}{n_y} = k$$

k_1 = (3.5+4.01+3.78+3.79+3.68)/5 - (3.96+3.67+3.97+3.71+3.93)/5 = -0.096

Difference in Average Comparative Evaluation of BIM Programs Among Students

k_2 = (3.75+4.09+4.08+3.82+3.83)/5 - (3.75+4.00+3.97+3.77+3.82)/5 = 0.052

Difference in Average Comparative Evaluation of BIM Programs Among Industry Professionals

Based on the obtained results, it can be concluded that with the process of learning and using both BIM platforms, the level of skills and abilities equalizes, and the preference in choice pertains only to the tasks faced by the architect and the functionality that ensures quick and high-quality completion of project tasks.

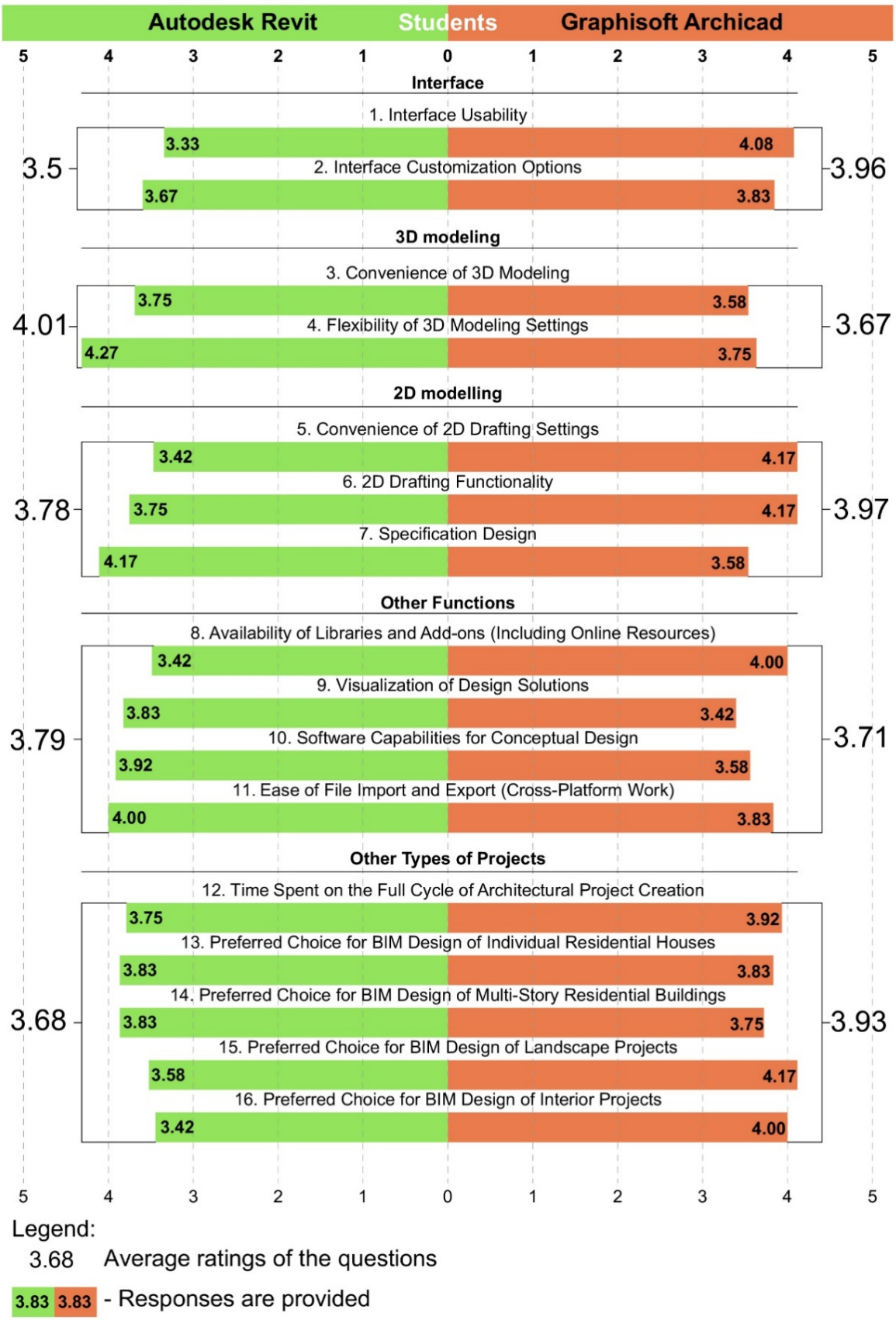

Figure 2 Comparative Analysis of BIM Software Usage in the Studied Student Group (created by the author)

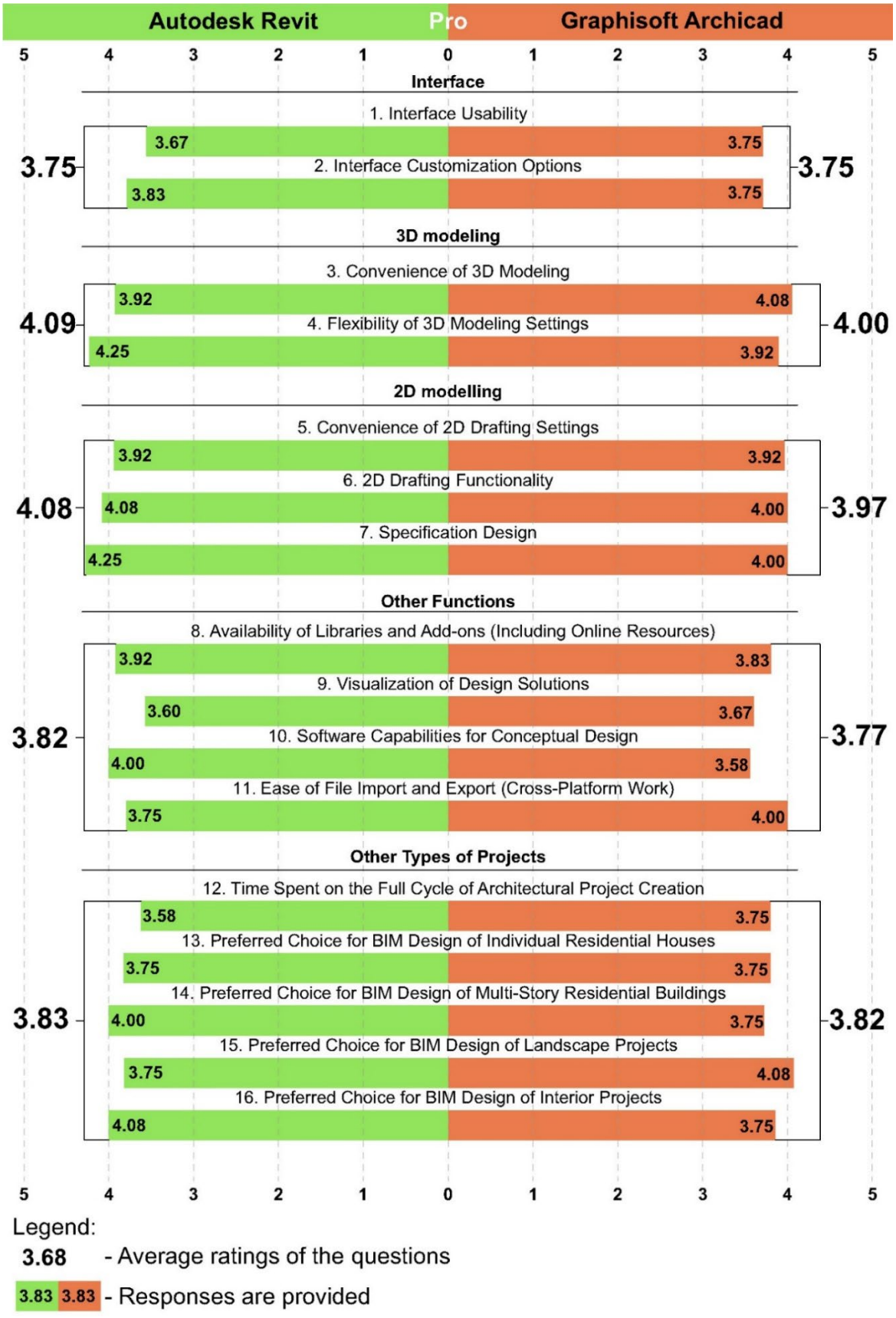

Figure 3 Comparative Analysis of BIM Software Usage in the Studied Group of Industry Professionals (created by the author)

4. Determining an Additional Indicator for BIM Software Mastery

A comparative analysis of the use of BIM software in the studied groups shows the students' evaluation after 1 semester of mastering the respective platforms and will change during further education and active use of both platforms.

The scientific literature presents approaches and methodologies that allow evaluating the effectiveness of learning and the complexity of mastering software. One of the main indicators is the *time required to master the software*. In this study, for students, it was 1 semester of training (5 months) according to the objectives of this study.

Based on the assessment conducted among students, *the index of the use of basic functions*—the share of basic functions of ArchiCAD and Revit actively used by students in coursework and diploma projects after completing the course—was determined. For Autodesk Revit, this assessment was 78.4%, and for Graphisoft ArchiCAD, it was 82.4%. It should be understood that the assessment in the studied group of students interprets the further application of the studied software only for the completion of student tasks in conceptual modelling, creating infographics, basic drawings, and documentation, hence a large number of functions will not be utilized.

Analyzing the *interface complexity index* (number of clicks to complete a specific task), we see that the ArchiCAD interface received a 0.46 higher rating than Revit among students. In the studied group of professionals, the interface rating of both programs is equal. These results indicate an insufficient level of skills in both platforms after 1 semester of training among students and the greater complexity of mastering Revit compared to ArchiCAD at the initial stage.

For a deeper analysis of the learning process among students, a *learning coefficient* was determined, indicating how quickly users can master the software under the same training conditions. For this purpose, the normative level of software mastery was determined according to the course curriculum, and self-assessment in the studied group of students provided indicators of learning progress when completing semester course tasks (Table 1).

Formed According to the Curriculum of the "BIM Technologies in Architecture" Course, the Normative Scale of Students' Task Performance Reflects the Expected Level of Program Mastery.

In the present table, (L_{max}) represents the expected level of software proficiency throughout the course. L_1 indicates the average level of proficiency in the subject matter while learning Autodesk Revit, based on student self-assessments. L_2 indicates the average level of proficiency in the subject matter while learning Graphisoft ArchiCAD, based on student self-assessments. Based on the progress results of the studied group, a student progress chart was created for the BIM technology in architecture course (Figure 4).

Table 1. The average progress indicators in the completion of tasks for the BIM technologies course in architecture (Created by the author).

Week	Task	Expected Level of Software Mastery, (L_{max})	Level of Mastery in Autodesk Revit, (L_1)	Level of Mastery in Graphisoft Archicad, (L_2)
1	Introduction to the Interface	5	4	4
2	Wall Settings. Reference Search	20	17	19
3	Wall Tool	30	25	28
4	Slab Tool	40	38	40
5	Roof Tool	50	44	47
6	Stair and Railing Modeling	60	55	58
7	Window and Door Settings	65	60	63
8	Interior Elements Settings	70	65	68
9	Site Plan Settings	75	69	73
10	Specifications Settings	82	76	78
11	Drawing Settings	87	85	86
12	Sheet Settings	95	92	94
13	Summary and Review	100	98	100

The analysis of this scale shows that in the first 4 weeks, students have more stable progress in mastering Graphisoft ArchiCAD, which approaches the normative scale. The mastering of Autodesk Revit is more unstable in the first weeks. A decline is observed in weeks 2-3, which may be related to the more complex interface and functionality of the program for students. We can assert that the period of 1-4 weeks is the *initial learning period*. During this time, students acquire basic software skills, familiarize themselves with the interface and main tools.

The period of 4-9 weeks is the *adaptation period*, where the scales of BIM program mastery gain stable progress and approach the expected level of material mastery. During this period, students partially actively assimilate the material, and their software skills improve. From week 4, the pace of mastering Revit increases, gradually catching up with ArchiCAD.

Weeks 6-13 are the *final period* of software mastery. During this period, students more easily assimilate new material, relying on the knowledge gained in previous periods, and automate a deep understanding of BIM platform functionality. In this period, both curves reach stable progress, approaching the normative scale.

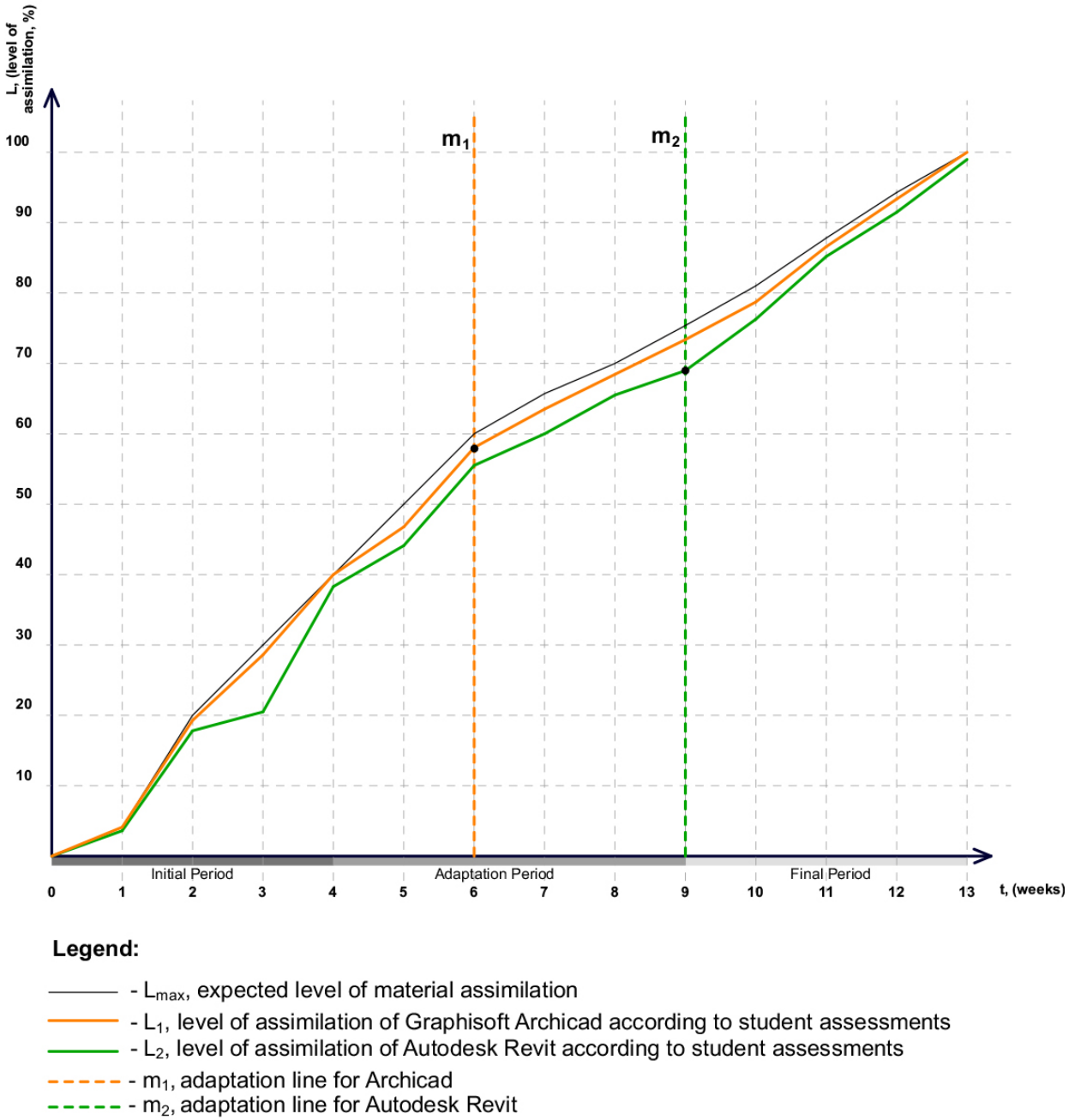

Figure 4 Student progress chart during the study of the BIM technologies course in architecture (created by the author)

By weeks 11-13, both curves almost coincide with the normative scale, indicating successful software mastery by students. The periods of BIM platform mastery may vary depending on the curriculum and course structure.

The overall assessment of the progress graph shows that the curve of Graphisoft ArchiCAD mastery progresses more uniformly, but the growth rate decreases slightly in the last period. This indicates that students reach the limit of mastering the basic level of the program. At the same time, the analysis of the Autodesk Revit mastery curve demonstrates an acceleration of learning after week 6. This indicates that after

the adaptation period, students begin to more effectively utilize the more complex functions of Revit. Based on these data, we assert the existence of the **software adaptation line** (m_1, m_2) - a key milestone that indicates the transition of students from initial software mastery to more confident use of its functions. This line allows us to evaluate how difficult it is to adapt to different software and determine which software is easier to implement at the initial stages of training. According to this graph, the adaptation line for Autodesk Revit is at week 9, while for Graphisoft ArchiCAD, it is at week 6, which is associated with the more user-friendly interface of ArchiCAD and its simpler functionality. This adaptation level indicator can be measured in terms of training time, such as hours or weeks. Undoubtedly, unifying diverse software for architects and creating a single adaptation indicator is a complex task due to the varied functions and tasks performed by the programs. However, the software adaptation line indicator helps understand how much time is needed for users to learn the respective software.

Results and Discussion

This study highlights the impact of modern BIM technologies on architectural education. A comparative analysis of Autodesk Revit and Graphisoft ArchiCAD in the context of architectural education provides valuable information regarding the effectiveness of these BIM platforms for student learning. The focus was on comparing the features of mastering these tools by students through the analysis of functional capabilities, interface intuitiveness, library accessibility, task completion speed, and support for interdisciplinary collaboration. The training took place within the course "BIM Technologies in Architecture," where students created information models of residential buildings using both platforms. The results show that Graphisoft ArchiCAD has a more convenient and intuitive interface, which facilitates initial program mastering, while Autodesk Revit provides higher efficiency in performing complex modelling and documentation tasks.

Students who worked with both platforms were able to evaluate their strengths and weaknesses. For instance, ArchiCAD was found to be more attractive for landscape design and interior tasks due to its extensive component libraries, whereas Revit's advantage in interdisciplinary collaboration confirms its popularity among architecture professionals.

The adaptation period to the programs also varied: Graphisoft ArchiCAD demonstrated more consistent learning progress during the first weeks, while Autodesk Revit required more time to reach a similar level of functionality mastery. In the later stages of training, students mastered both platforms more evenly to the expected level of proficiency.

The difference in adaptation curves between ArchiCAD and Revit indicates the need for developing educational materials that consider this aspect. For example, interactive instructions or video tutorials can be particularly useful for mastering Revit's complex functionality. Meanwhile, ArchiCAD can be more effectively integrated into beginner courses due to its simplicity.

Each platform has a distinct software adaptation line; thus, the duration of mastering basic skills in Archicad and Revit varies, given the same task, course duration, and the initial knowledge level of the studied student group. In the final stage of software study, the learning progress results in the studied group approach the expected level of material mastery. However, this is related to the course completion period and the final assessment in the studied student group, reflecting more active independent work by students in improving their BIM platform skills during the semester task completion process. Consequently, students with equal conditions for mastering the relevant professional software demonstrate different levels of mastery over the same time intervals, disproving the research hypothesis.

Analyzing the software adaptation line as an indicator of the speed of mastering the corresponding BIM platform, we see opportunities for improving Autodesk Revit by modifying the user interface, which would reduce the adaptation period by 1-2 weeks.

In the educational process, the combined use of both platforms is important. This ensures students acquire a broad range of skills necessary for professional activities and prepares them for working in interdisciplinary project environments. The obtained results can be useful for optimizing BIM technology training programs and justifying the choice of software for training. Additionally, integrating both platforms into the educational process allows students to acquire universal skills, which are crucial in modern architectural practice. Additionally, educational programs can be structured for a phased implementation of platforms. Initially, ArchiCAD can be used to introduce basic concepts, followed by transitioning to Revit for more advanced tasks. This approach can help reduce initial student stress and ensure more consistent learning progress.

Future research could focus on the long-term assessment of the impact of both platforms on students' professional activities, as well as the effectiveness of different methods of teaching BIM technologies.

Conclusions

Autodesk Revit and Graphisoft ArchiCAD are powerful tools for learning BIM technologies, each with its own advantages. ArchiCAD demonstrates a simpler and more convenient interface for initial learning, while Revit provides better capabilities for performing complex 3D modelling tasks and interdisciplinary collaboration.

As a result of the conducted survey, students preferred different platforms for various types of tasks. ArchiCAD was found to be more effective for landscape design and interiors due to its extensive libraries, whereas Revit became the preferred choice for architectural design and project documentation creation.

The learning progress graph of the studied BIM software among students showed that Graphisoft ArchiCAD ensures more uniform learning at initial stages, while Autodesk Revit requires more time for adaptation. However, Revit subsequently demonstrates significant acceleration in learning due to its extensive functional capabilities.

A noteworthy finding is the software adaptation line, which allows for an assessment of the software learning duration for users and helps structure the training program in educational institutions. Therefore, the obtained results can be used to optimize BIM technology training programs, particularly for creating courses that consider the specific features and advantages of both platforms, as well as preparing students for real-world interdisciplinary projects.

To comprehensively develop students' professional competencies, it is advisable to use both platforms in the educational process. This will ensure the holistic assimilation of BIM technologies, including basic and advanced skills required in modern architectural practice. Thus, the research confirms the necessity of a combined approach to training, allowing for the most effective use of Autodesk Revit and Graphisoft ArchiCAD capabilities in preparing future architects.

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Анотація

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Порівняльний експеримент щодо ефективності засвоєння технології BIM в архітектурній освіті

BIM-технології сьогодні є невід’ємною частиною архітектурного проєктування та будівництва, забезпечуючи інтеграцію, автоматизацію та оптимізацію процесів у цій сфері. Освоєння BIM є важливою складовою сучасної архітектурної освіти, що вимагає використання ефективних програмних інструментів, технологій, які відіграють ключову роль у сучасному проєктуванні та управлінні будівництвом. В даній публікації проведено порівняльний аналіз ефективності використання програмних продуктів Autodesk Revit та Graphisoft Archicad у контексті роботи на різних стадіях створення архітектурного проєкту.

Основною метою дослідження є аналіз процесу засвоєння фахових компетентностей в процесі вивчення BIM-платформ. Опираючись на дослідження функціональних особливостей БІМ технологій в архітектурному проєктуванні висунуто гіпотезу, що студенти, які освоюють певні BIM платформи протягом однакового проміжку часу та інтенсивності навчання мають подібний рівень навичок роботи в них, через спільні алгоритми роботи в системі створення інформаційної моделі.

Ця стаття наочно демонструє незалежний комплексний аналіз та оцінку вивчення БІМ-софту включаючи інтуїтивність інтерфейсу, зручність інструментів моделювання, створення проєктної документації, параметричного моделювання, підтримку міждисциплінарного співробітництва, а також доступність бібліотек та зручність використання в архітектурні, ландшафтному дизайні чи дизайні інтер'єрів. Також в ході аналізу запропоновано використання лінії адаптації софту - універсального критерію оцінки часу, необхідного студентам для засвоєння базових функцій програмного забезпечення.

У висновках підсумовано досвід студентів з вивчення дисципліни BIM-технології в архітектурі, сформовано рекомендації, щодо комбінованого вивчення Graphisoft Archicad та Autodesk Revit для всебічного розвитку навичок та фахових компетентностей студентами, необхідних для роботи в сучасній архітектурній сфері. Результати дослідження сприятимуть підвищенню якості підготовки майбутніх архітекторів та матимуть практичну цінність для освітніх закладів у процесі модернізації навчальних програм. Також вони можуть послугувати орієнтиром для розробників програмного забезпечення у вдосконаленні їхніх продуктів із врахуванням потреб освіти.

Ключові слова: БІМ технології; Archicad; Revit; архітектурна освіта; підготовка майбутніх архітекторів.