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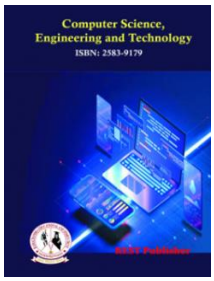

Assessment of Introduction to Computers and AutoCAD using the FUZZY TOPSIS Method

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Abstract: *Computers have become an integral part of various industries, revolutionizing the way we design and engineer projects. Among the most powerful tools in this realm is AutoCAD. AutoCAD is a computer-aided design (CAD) software that enables professionals in architecture, engineering, and construction to create precise and detailed 2D and 3D models. It provides a digital canvas where intricate structures and mechanical designs can be visualized, modified, and analysed with precision. Understanding the basics of computers is essential for anyone looking to excel in the field of design and engineering. This includes familiarity with hardware components, operating systems, and software applications. Proficiency in AutoCAD is particularly crucial as it streamlines the design process, enhances accuracy, and allows for easy collaboration among team members. It also facilitates the creation of intricate blueprints, schematics, and prototypes, ensuring that designs meet exact specifications. AutoCAD's versatility extends beyond architectural design; it finds applications in various industries, including manufacturing, aerospace, and automotive. Engineers and designers use AutoCAD to create detailed models, simulate performance, and generate documentation for production. Moreover, AutoCAD's compatibility with other software and its extensive library of design resources makes it an indispensable tool for professionals seeking efficiency and precision in their work. The significance of understanding Computers and AutoCAD lies at the heart of modern engineering and design practices. In today's technological landscape, proficiency in computer systems and specialized software like AutoCAD is crucial for professionals in various industries, particularly in architecture, engineering, and construction. Efficiency and Precision: Knowledge of computers and AutoCAD allows professionals to create precise and detailed designs with efficiency. It streamlines the design process, reducing the time required for manual drafting and ensuring accuracy in measurements and specifications. Enhanced Collaboration: AutoCAD facilitates seamless collaboration among team members working on a project. It enables multiple stakeholders to work on a design simultaneously, regardless of geographical location, leading to improved productivity and collective problem-solving. Versatility Across Industries: Beyond architecture and construction, AutoCAD finds applications in a wide range of industries, including manufacturing, aerospace, and automotive. Professionals in these fields rely on AutoCAD for creating intricate models, simulating performance, and generating production-ready documentation. The Fuzzy TOPSIS method serves as a decision-making tool, particularly beneficial for situations involving uncertainty or where group consensus is essential. Through thorough analysis, comparisons, and other relevant assessments, we identify a clear need for this objective grading technique, which is widely recognized and utilized. Initiated by KAU Projects, the Fuzzy TOPSIS approach classifies projects into four distinct categories: instructional homes, staff quarters, KAU campus streets, and infrastructure projects. Computer Basics, AutoCAD Fundamentals, Introduction to Computing, Advanced AutoCAD and Computer Essentials. Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10). the Ranking of Introduction to Computers and AutoCAD of Final Result in Computer Essentials is got the first rank whereas is the Advanced AutoCAD is having the Lowest rank.*

Keywords: *MCDM, Computer Basics, AutoCAD Fundamentals, Introduction to Computing, Advanced AutoCAD and Computer Essentials.*

1. INTRODUCTION

Creating technical illustrations is a critical aspect of fields like Mechanical Engineering and Construction. This includes drafting for items such as Auto Gates and various other products. This process involves employing software tools, not only limited to AutoCAD, but also applicable in a wide array of applications. It's crucial to

distinguish these technical drawings from other visual materials like posters. This article particularly focuses on utilizing AutoCAD software on a computer to generate 2D representations of objects and structures. We've devised an instructional approach to teach students how to effectively translate concepts into flat images using this software [1]. Through this method, we aim to impart the skills needed for accurate and precise modelling, as well as measurements. When executed accurately, this technique is highly recommended for producing detailed and accurate representations. In the ever-evolving landscape of technology, proficiency in computer applications and software has become a fundamental skill. Among these, AutoCAD stands as a cornerstone in industries relying on precise design and drafting. This comprehensive course, "Introduction to Computers and AutoCAD," delves into the intricacies of both realms, equipping learners with essential knowledge and hands-on experience [2]. The course commences with a thorough exploration of basic computer literacy. Participants are introduced to hardware components, operating systems, and software essentials. Fundamental concepts of file management, internet navigation, and digital communication are covered in detail. Practical exercises accompany theoretical sessions, ensuring a holistic understanding of computer systems [3]. As the course progresses, the focus shifts towards AutoCAD, an industry-standard software for computer-aided design and drafting. Participants are acquainted with the user interface, drawing tools, and precision techniques. Through a series of guided tutorials, they learn to create 2D and 3D models, annotate drawings, and apply essential modifications. Special emphasis is placed on efficiency and accuracy, vital skills for any aspiring drafter or designer [4]. Furthermore, the curriculum delves into advanced features of AutoCAD, allowing participants to harness the software's full potential. Topics include parametric drawing, dynamic blocks, and 3D modelling techniques. The course also addresses collaborative work environments, teaching participants how to efficiently manage large-scale projects with multiple contributors. One of the course's strengths lies in its hands-on approach. Practical assignments and projects provide learners with ample opportunities to apply their newfound knowledge. From conceptualizing architectural plans to engineering precise mechanical components, participants gain valuable experience in real-world scenarios. Additionally, they receive constructive feedback and guidance from experienced instructors, facilitating their growth and skill development [5]. In addition to technical proficiency, the course places a strong emphasis on problem-solving and critical thinking. Participants engage in design challenges and case studies, honing their ability to tackle complex drafting tasks. They learn to analyze requirements, conceptualize solutions, and implement designs that meet industry standards. This aspect of the course not only enhances their drafting skills but also nurtures a creative and analytical mindset [6]. Moreover, the course addresses the importance of industry-specific standards and best practices. Participants learn about drafting conventions, dimensioning standards, and annotation styles commonly used in various fields. This knowledge is invaluable for aspiring professionals, as it ensures their work is compatible with existing projects and easily understandable to colleagues and stakeholders. As the course draws to a close, participants are encouraged to embark on individual projects that align with their interests and career aspirations. Whether it's designing architectural floor plans, engineering mechanical components, or creating intricate 3D models, learners have the freedom to showcase their creativity and apply their skills in a self-directed endeavor [7]. AutoCAD is not just another specialized core course in Architectural Engineering; it stands out as an exceptionally practical and essential subject. Its integration into the construction industry highlights its significance. The curriculum structure has been meticulously refined to address real-world challenges encountered in teaching. It emphasizes adaptable application and innovation in Architectural CAD techniques, fostering skill development. In China's current phase of mass education in higher institutions, there is an extensive demand for applied skills in architecture and engineering technology [8]. Specializing in engineering necessitates a solid grasp of foundational knowledge, hands-on experience in manufacturing engineering, and robust practical abilities. This enables professionals to proficiently engage in architectural projects, including design, construction, and management. In the modern Information Age, computer graphics have become the cornerstone of design, construction, and management in Architectural Engineering projects. Computer-aided design, particularly AutoCAD, has emerged as the go-to software for creating intricate drafts. It is widely utilized in the construction industry for its robust features, user-friendly interface, and open structure [9]. However, challenges persist in integrating AutoCAD effectively into education. The expansion of enrollments in recent years has outpaced the development of necessary hardware infrastructure. This has led to a deficiency in computer labs and hindered hands-on learning. Furthermore, there is a gap in connecting AutoCAD with other professional courses and curriculum designs, particularly in graduation projects. Resolving these issues and refining the AutoCAD syllabus is imperative for comprehensive design education. CAD, with its computer-aided approach, not only aids in conceptualizing designs but also facilitates drafting, system analysis, and optimization [10]. AutoCAD, being a powerful and user-friendly CAD software, has become an indispensable tool for Chinese technicians. It has become a cornerstone in the construction industry, widely utilized in various applications. Given the constraints of a three-year architectural engineering program, it is impractical to teach every specialized graphics software. Hence, focusing on foundational software like AutoCAD becomes essential [11]. The teaching objective for AutoCAD courses in architecture emphasizes providing students with the technical proficiency to apply AutoCAD effectively in architectural engineering, enabling them to create accurate and compliant construction drawings. This ensures that students are well-versed in using AutoCAD and other specialized software to excel in their field.

In the dynamic realm of architectural engineering, the integration of computers and AutoCAD has ushered in a transformative era. No longer confined to the realms of drafting tables and manual calculations, the advent of digital technology has revolutionized the way structures are conceptualized, designed, and constructed [12]. AutoCAD, a robust Computer-Aided Design (CAD) software, stands as the cornerstone of this revolution, offering architects and engineers an unparalleled tool to bring their visions to life. The significance of AutoCAD in architectural engineering cannot be overstated. Its versatility and precision have redefined the drafting process, enabling professionals to create intricate and accurate designs with remarkable efficiency. The software's intuitive interface empowers users to navigate a wide array of design tools, from basic geometric shapes to complex three-dimensional models [13]. This versatility is a boon, allowing architects to craft designs that range from the conceptual to the highly detailed, accommodating structures of various scales and complexities. One of AutoCAD's distinct advantages lies in its ability to facilitate meticulous planning and analysis. Engineers and architects can scrutinize every aspect of a design, from structural integrity to material usage, allowing for refined and optimized blueprints. This not only enhances the quality of construction but also leads to more resource-efficient and sustainable outcomes. By simulating various scenarios, professionals can make informed decisions that result in structures that not only meet aesthetic and functional criteria but also adhere to budgetary and environmental considerations [14]. The collaborative potential of AutoCAD is another facet that sets it apart. Through cloud-based platforms and real-time sharing features, design teams can seamlessly work together regardless of geographical barriers. This fosters a dynamic exchange of ideas and expertise, ultimately leading to more refined and innovative designs. Moreover, AutoCAD's compatibility with Building Information Modeling (BIM) systems facilitates a holistic approach to architectural engineering. It allows for the integration of various elements like structural, mechanical, and electrical systems into a unified model, ensuring comprehensive coordination among different disciplines [15]. The impact of this technology extends beyond the drawing board and influences the actual construction process. AutoCAD-generated drawings serve as the blueprint for builders, providing them with precise instructions for executing the design. This minimizes errors, reduces material wastage, and accelerates the construction timeline. Furthermore, the accuracy and detail inherent in AutoCAD designs enable builders to address potential challenges before they arise on the construction site, resulting in smoother, more efficient projects [16]. In the realm of architectural engineering education, AutoCAD plays a pivotal role in equipping the next generation of professionals with essential skills. Students are introduced to this software early in their academic journey, allowing them to familiarize themselves with its functionalities and capabilities. This hands-on experience is invaluable, as it not only imparts technical proficiency but also encourages creativity and innovation. By learning to leverage AutoCAD's extensive toolset, students are prepared to tackle the complex design challenges they will encounter in their careers [17]. Beyond its technical prowess, AutoCAD embodies adaptability and continuous evolution. Autodesk, the company behind AutoCAD, regularly updates the software to incorporate cutting-edge features and improvements. This ensures that architects and engineers have access to the latest tools and technologies, enabling them to stay at the forefront of their field. Additionally, AutoCAD's extensive library of plugins and extensions allows users to tailor the software to their specific needs, further enhancing its versatility [18].

2. MATERIALS AND METHOD

Computer Basics: Computer Basics is a foundational course that introduces individuals to the fundamental concepts of computing. Participants learn about the essential components of a computer system, including hardware, software, and peripherals. They gain an understanding of operating systems, file management, and basic troubleshooting techniques. Additionally, the course covers topics like internet navigation, email communication, and basic security practices.

AutoCAD Fundamentals: AutoCAD Fundamentals is a specialized course focused on teaching the core principles of AutoCAD, a powerful Computer-Aided Design (CAD) software. Participants learn how to create precise 2D and 3D drawings, manipulate objects, and use a range of drawing and editing tools. The course delves into topics like layers, dimensions, and annotations, enabling individuals to create detailed and accurate technical drawings.

Introduction to Computing: Introduction to Computing is a comprehensive course designed to familiarize individuals with the broader concepts of computing. It covers a range of topics, including computer hardware and software, operating systems, networks, and data management. Participants also gain insight into emerging technologies and their impact on various industries.

Advanced AutoCAD: Building on the foundation provided by the AutoCAD Fundamentals course, Advanced AutoCAD delves into more complex features and techniques. Participants learn advanced 3D modelling,

rendering, and visualization skills. They explore concepts like parametric design and customization, enabling them to create intricate and sophisticated architectural and engineering designs.

Computer Essentials: Computer Essentials is a course that covers a wide range of topics related to basic computer usage. Participants learn about common productivity software, such as word processing, spreadsheets, and presentation tools. Additionally, the course may include modules on internet safety, online collaboration, and effective use of productivity applications. These courses collectively provide a well-rounded education in both general computing knowledge and specialized skills in AutoCAD, catering to individuals seeking a solid foundation in computer literacy and those aiming for proficiency in architectural and engineering design using AutoCAD software.

Method: The Fuzzy TOPSIS method serves as a decision-making tool, particularly beneficial for situations involving uncertainty or where group consensus is essential. Through thorough analysis, comparisons, and other relevant assessments, we identify a clear need for this objective grading technique, which is widely recognized and utilized [19]. Initiated by KAU Projects, the Fuzzy TOPSIS approach classifies projects into four distinct categories: instructional homes, staff quarters, KAU campus streets, and infrastructure projects. The primary objective is to efficiently manage all construction endeavors by minimizing costs and imposing suitable penalties for any delays. In cases involving the development of KAU projects, which often face considerable uncertainty and budgetary constraints, this methodology proves to be invaluable [20]. The integration of Fuzzy with MCDM enhances the assessment process through techniques like TOPSIS. This approach is instrumental in determining the preferred weight for each criterion, subsequently bridging the gaps between actual and optimal alternatives. It employs comprehensive research to evaluate TOPSIS performance values, employing various measurements and scales to discern the best options among the layers of alternatives proposed by four different companies. This research holds significant promise for Taiwanese industries and offers strategic insights for decision-makers [21]. In the domain of facility location, the Fuzzy TOPSIS technique has been put forth as an examination method. It addresses numerous subjective criteria and provides abundant opportunities for reviewing potential sites. The technique handles the ambiguity in weights associated with all the criteria, providing numerical references for evaluation [22]. The results derived from TOPSIS assessments, which may initially appear ambiguous, are further elucidated through discrete distance measurements. Each distance scale is computed using the C programming language, providing clarity to the initially unclear TOPSIS scores. This comparative analysis, supplemented by stability ratios, is presented with detailed discussions [23]. The Hsu and Chen approach has successfully employed the Fuzzy TOPSIS technique to ensure compatibility between concepts. This approach circumvents the complexity of aggregating random fuzzy numbers and opts for weighted ratings, simplifying the rank approach while avoiding common pitfalls [24]. Efficient utilization of Fuzzy TOPSIS involves distinguishing between "Unambiguous High Quality Satisfactory Solution" and "ambiguous negative-best answer". This technique acknowledges that unambiguous ranking may not always be attainable. In all situations, the numbers are considered satisfactory. However, evaluating the proximity between ideal and anti-ideal solutions presents challenges. To address this, a novel TOPSIS approach has been proposed [25]. The proposed method involves scoring decision makers and establishing average and comparable weights for each category. Normalization is applied to all club activities, ensuring fair representation. Additionally, the process of replacing net worth values takes into account the magnitude of proximity for both negative and positive responses, aiding in distance calculations [26]. In recent years, there has been significant progress in the application of Fuzzy TOPSIS methods. Initially utilizing fuzzy numbers, this approach focuses on relative closeness to generate ambiguity, guided by mathematical principles. The extension of this approach involves integrating alpha spacing and degrees of ideality based on fuzzy MCDM ideals and standards. This extension caters to unexplained GDM conditions, aligning with provisions set forth in collection units [27]. Within the realm of MCDM techniques, TOPSIS stands out for its ability to select pairs based on performance, ranking, and a balanced approach that addresses both subjectivity with weight and objective criteria. The introduction of Euclidean distance scaling has enhanced its effectiveness [28]. Fuzzy TOPSIS finds application in diverse fields such as supply chain management, eco-friendly solutions, and the energy industry, distinguishing itself in areas of particular interest like weapon selection and healthcare solutions [29]. It also addresses multivariate problems in attribute selection, proving valuable for tasks such as plant location selection, dealer selection for TOPSIS, and machine selection for commercial robotics [30].

3. ANALYSIS AND DISCUSSION

TABLE 1. Introduction To Computers and AutoCAD

	Technical Knowledge (1-10)	**Practical Application (1-10)**	**Problem Solving (1-10)**	**Overall Satisfaction (1-10)**
Computer Basics	34.56	155.63	32.63	22.05

AutoCAD Fundamentals	33.48	175.15	45.63	27.30
Introduction to Computing	25.63	185.62	32.16	23.10
Advanced AutoCAD	38.46	125.29	55.54	25.15
Computer Essentials	40.63	186.35	30.16	20.89

Table 1 show the Introduction to Computers and AutoCAD in Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10). Computer Basics, AutoCAD Fundamentals, Introduction to Computing, Advanced AutoCAD and Computer Essentials it is has been Computer Essentials - 40.63 is Showing the Highest Value Technical Knowledge and Introduction to Computing - 25.63 is Showing the Lowest Value. Computer Essentials - 186.35 is Showing the Highest Value Practical Application and Lowest: Advanced AutoCAD - 125.29 is Showing the Lowest Value. Advanced AutoCAD - 55.54 is Showing the Highest Value Problem Solving and Computer Essentials - 30.16 is Showing the Lowest Value. AutoCAD Fundamentals - 27.30 is Showing the Highest Value Overall Satisfaction and Computer Essentials - 20.89 is Showing the Lowest Value.

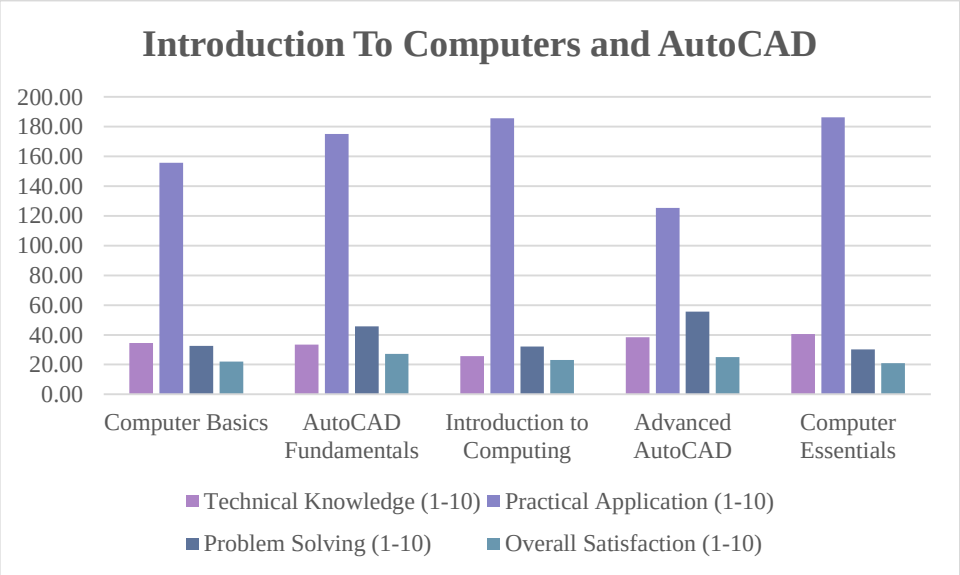

FIGURE 1. Introduction to Computers and AutoCAD

Figure 1 show the Introduction to Computers and AutoCAD in Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10). Computer Basics, AutoCAD Fundamentals, Introduction to Computing, Advanced AutoCAD and Computer Essentials it is has been Computer Essentials - 40.63 is Showing the Highest Value Technical Knowledge and Introduction to Computing - 25.63 is Showing the Lowest Value. Computer Essentials - 186.35 is Showing the Highest Value Practical Application and Lowest: Advanced AutoCAD - 125.29 is Showing the Lowest Value. Advanced AutoCAD - 55.54 is Showing the Highest Value Problem Solving and Computer Essentials - 30.16 is Showing the Lowest Value. AutoCAD Fundamentals - 27.30 is Showing the Highest Value Overall Satisfaction and Computer Essentials - 20.89 is Showing the Lowest Value.

TABLE 2. Square and Root of Value.

1194.3936	24220.6969	1064.7169	486.2025
1120.9104	30677.5225	2082.0969	745.2900
656.8969	34454.7844	1034.2656	533.6100
1479.1716	15697.5841	3084.6916	632.5225
1650.7969	34726.3225	909.6256	436.3921

Table 2 shows the Square and Root of Value Introduction to Computers and AutoCAD for Analysis using the TOPSIS Method. Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10). Computer Basics, AutoCAD Fundamentals, Introduction to Computing, Advanced AutoCAD and Computer Essentials SQRT Value.

TABLE 3. Normalized Data

Technical Knowledge (1-10)	Practical Application (1-10)	Problem Solving (1-10)	Overall Satisfaction (1-10)
0.4424	1.9923	0.3609	0.4142
0.4286	2.2422	0.5047	0.5128
0.3281	2.3762	0.3557	0.4339
0.4923	1.6039	0.6143	0.4724
0.5201	2.3855	0.3336	0.3924

Table 3 shows the Normalized Data Introduction to Computers and AutoCAD for Analysis using the TOPSIS Method. Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10). Computer Basics, AutoCAD Fundamentals, Introduction to Computing, Advanced AutoCAD and Computer Essentials is the Normalized Value.

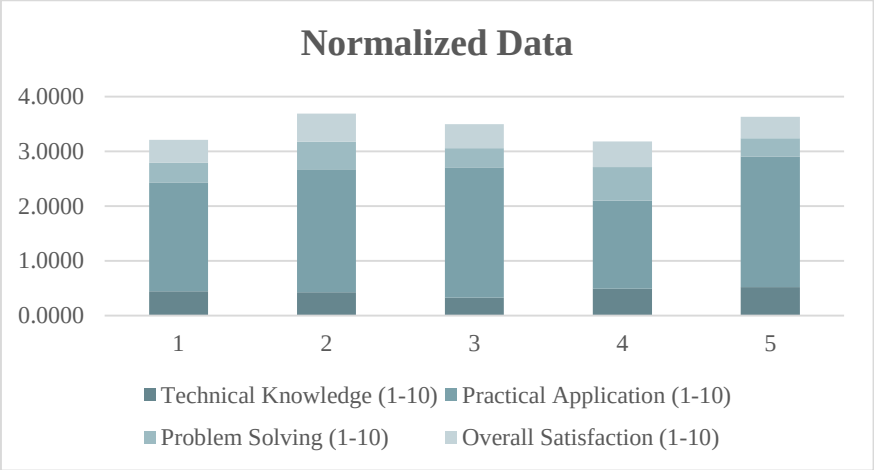

FIGURE 2. Normalized Data

Figure 2 shows the Normalized Data Introduction to Computers and AutoCAD for Analysis using the TOPSIS Method. Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10). Computer Basics, AutoCAD Fundamentals, Introduction to Computing, Advanced AutoCAD and Computer Essentials is the Normalized Value.

TABLE 4. Calculate the fuzzy lingustic scale & Significance Value.

		l	m	u
Extremely low	EL	0.1	0.3	0.5
very low	VL	0.3	0.5	0.7
low	L	0.1	0.3	0.5
medium	M	0.5	0.7	0.9
high	H	0.3	0.5	0.7
very high	VH	0.7	0.9	1
Extremely high	EH	0.9	1	1

Table 4 shows the Calculate the fuzzy lingustic scale & Significance Value Introduction to Computers and AutoCAD for Analysis using the TOPSIS Method. Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10). Computer Basics, AutoCAD Fundamentals, Introduction to Computing, Advanced AutoCAD and Computer Essentials.

TABLE 5. Criteria lingustic scale using common value.

	DM1	DM2	DM3
	Onwer	Capten	Coach
Technical Knowledge (1-10)	EH	VL	M
Practical Application (1-10)	L	EH	VH
Problem Solving (1-10)	L	M	VH
Overall Satisfaction (1-10)	L	M	VL

Table 5 shows the Criteria lingustic scale using common value of Introduction to Computers and AutoCAD for Analysis using the TOPSIS Method. Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10).

TABLE 6. Convert the lingustic rating of decision makers into quantative value.

	DM1			DM2			DM3		
Technical Knowledge (1-10)	0.9	1	1	0.3	0.5	0.7	0.5	0.7	0.9
Practical Application (1-10)	0.1	0.3	0.5	0.9	1	1	0.7	0.9	1
Problem Solving (1-10)	0.1	0.3	0.5	0.5	0.7	0.9	0.7	0.9	1
Overall Satisfaction (1-10)	0.1	0.3	0.5	0.5	0.7	0.9	0.3	0.5	0.7

Table 6 shows the Convert the lingustic rating of decision makers into quantative value of Introduction to Computers and AutoCAD for Analysis using the TOPSIS Method. Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10).

TABLE 7. Calculate Aggregated Fuzzy Weight Value

	L-FW	M-FW	U-FW
Technical Knowledge (1-10)	0.57	0.73	0.87
Practical Application (1-10)	0.57	0.73	0.83
Problem Solving (1-10)	0.43	0.63	0.80
Overall Satisfaction (1-10)	0.30	0.50	0.70

Table 7 shows the Calculate Aggregated Fuzzy Weight Value of Introduction to Computers and AutoCAD for Analysis using the TOPSIS Method. Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10).

TABLE 8. Weighted normalized decision matrix

Technical Knowledge (1-10)			**Practical Application (1-10)**			**Problem Solving (1-10)**			**Overall Satisfaction (1-10)**		
0.250703	0.324439	0.383428	1.128961	1.461008	1.660236	0.156381	0.228557	0.288704	0.124259	0.207099	0.289938
0.242868	0.3143	0.371446	1.270561	1.644256	1.868473	0.218685	0.319616	0.403725	0.153845	0.256408	0.358971
0.185923	0.240607	0.284353	1.346512	1.742545	1.980165	0.154129	0.225265	0.284545	0.130176	0.216961	0.303745
0.278994	0.361051	0.426697	0.90887	1.176185	1.336574	0.266179	0.389031	0.491407	0.141729	0.236215	0.3307
0.294735	0.381422	0.450772	1.351808	1.749398	1.987953	0.144544	0.211256	0.26685	0.117722	0.196204	0.274685

Table 8 shows the Weighted normalized decision matrix Introduction to Computers and AutoCAD for Analysis using the TOPSIS Method. Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10). Computer Basics, AutoCAD Fundamentals, Introduction to Computing, Advanced AutoCAD and Computer Essentials is the Weighted normalized decision matrix of Value.

TABLE 9. A+, A- Maximum and Minimum value

A+	0.294735	0.381422	0.450772	1.351808	1.749398	1.987953	0.144544	0.211256	0.26685	0.117722	0.196204	0.274685
A-	0.185923	0.240607	0.284353	0.90887	1.176185	1.336574	0.266179	0.389031	0.491407	0.153845	0.256408	0.358971

Table 9 shows the A+, A- Maximum and Minimum Value Introduction to Computers and AutoCAD for Analysis using the TOPSIS Method. Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10). Computer Basics, AutoCAD Fundamentals, Introduction to Computing, Advanced AutoCAD and Computer Essentials Maximum and Minimum Value.

TABLE 10. Fuzzy positive ideal solution

Computer Basics	0.056924	0.282977	0.017484	0.011461

AutoCAD Fundamentals	0.067053	0.103169	0.109504	0.063334
Introduction to Computing	0.14067	0.006724	0.014157	0.021836
Advanced AutoCAD	0.02035	0.562453	0.179652	0.042091
Computer Essentials	0	0	0	0

Table 10 shows the Fuzzy positive ideal solution Introduction to Computers and AutoCAD for Analysis using the TOPSIS Method. Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10). Computer Basics, AutoCAD Fundamentals, Introduction to Computing, Advanced AutoCAD and Computer Essentials Fuzzy positive ideal solution is the Value.

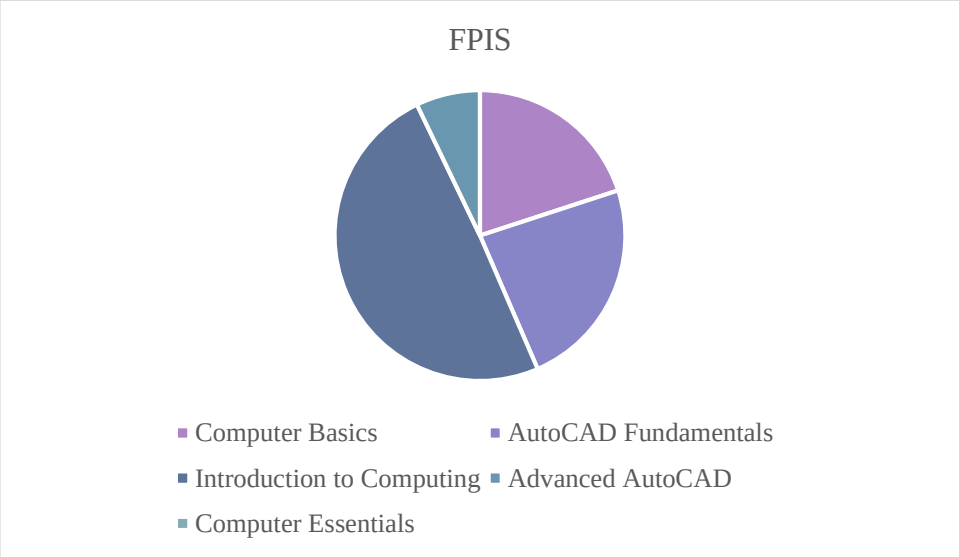

FIGURE 3. Fuzzy positive ideal solution

Figure 3 shows the Fuzzy positive ideal solution Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10). Computer Basics, AutoCAD Fundamentals, Introduction to Computing, Advanced AutoCAD and Computer Essentials Fuzzy positive ideal solution is the Value.

TABLE 11. Fuzzy Negative Ideal solution

Computer Basics	0.083746	0.279476	0.162168	0.051872
AutoCAD Fundamentals	0.073617	0.459285	0.070148	0
Introduction to Computing	0	0.555729	0.165495	0.041498
Advanced AutoCAD	0.12032	0	0	0.021243
Computer Essentials	0.14067	0.562453	0.179652	0.063334

Table 11 shows the Fuzzy Negative ideal solution Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10). Computer Basics, AutoCAD Fundamentals, Introduction to Computing, Advanced AutoCAD and Computer Essentials Fuzzy Negative ideal solution is the Value.

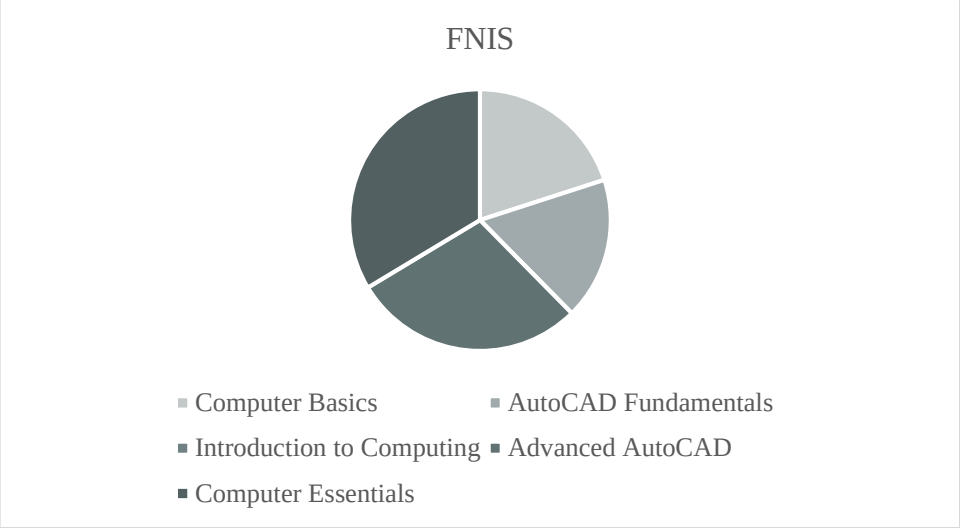

FIGURE 4. Fuzzy Negative ideal solution

Figure 4 shows the Fuzzy Negative ideal solution Technical Knowledge (1-10), Practical Application (1-10), Problem Solving (1-10) and Overall Satisfaction (1-10). Computer Basics, AutoCAD Fundamentals, Introduction to Computing, Advanced AutoCAD and Computer Essentials Fuzzy Negative ideal solution is the Value.

TABLE 12. Si positive, Si negative, CCi Closeness coefficient & Final Result

	Si+	**Si-**	**Cci**	**Rank**
Computer Basics	0.368846	0.5772628	0.610144	4
AutoCAD Fundamentals	0.343059	0.6030498	0.6374	3
Introduction to Computing	0.183387	0.7627221	0.806167	2
Advanced AutoCAD	0.804547	0.1415627	0.149626	5
Computer Essentials	0	0.9461093	1	1

Table 12 shows the Si positive, Si negative, CCi Closeness coefficient & Final Result Si positive, Advanced AutoCAD is having is Higher Value and Computer Essentials is having Lower value. In Si Negative, Computer Essentials is having is Higher Value Advanced AutoCAD 4 is having Lower value. Ci is calculated using the formula (5). In Ci, Computer Essentials is having is Higher Value and Advanced AutoCAD is having Lower value.

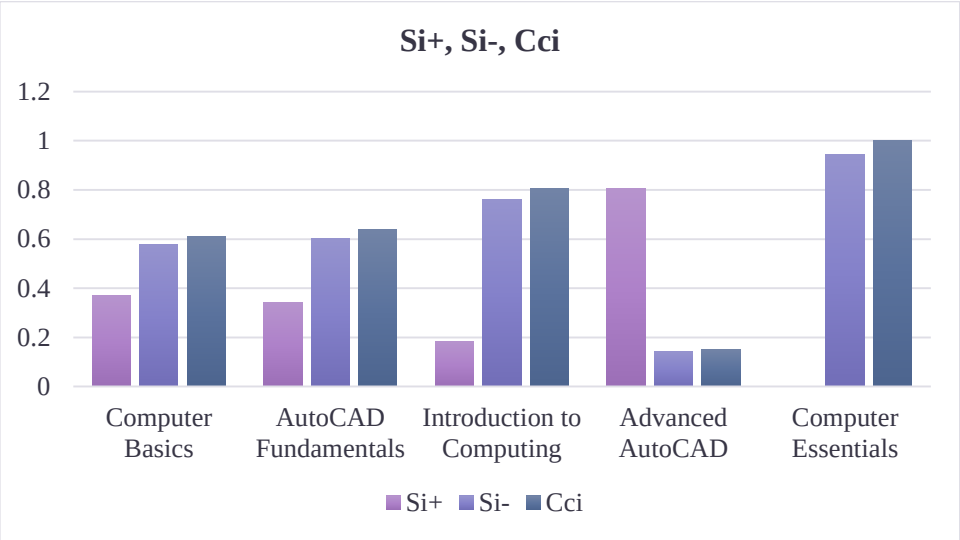

FIGURE 5. Si positive, Si negative, CCi Closeness coefficient & Final Result

Figure 5 shows the Si positive, Si negative, CCi Closeness coefficient & Final Result Si positive, Advanced AutoCAD is having is Higher Value and Computer Essentials is having Lower value. In Si Negative, Computer Essentials is having is Higher Value Advanced AutoCAD 4 is having Lower value. Ci is calculated using the formula (5). In Ci, Computer Essentials is having is Higher Value and Advanced AutoCAD is having Lower value.

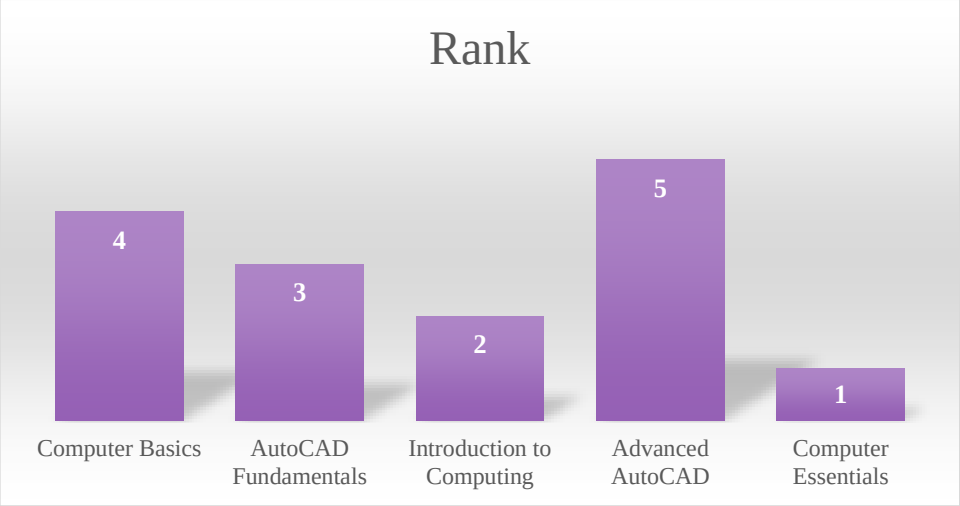

FIGURE 6. Shown the Rank

Figure 6 Shows the Ranking of Introduction to Computers and AutoCAD of Final Result in Computer Essentials is got the first rank whereas is the Advanced AutoCAD is having the Lowest rank.

CONCLUSION

Computers have become an integral part of various industries, revolutionizing the way we design and engineer projects. Among the most powerful tools in this realm is AutoCAD. It provides a digital canvas where intricate structures and mechanical designs can be visualized, modified, and analysed with precision. Understanding the basics of computers is essential for anyone looking to excel in the field of design and engineering. This includes familiarity with hardware components, operating systems, and software applications. Proficiency in AutoCAD is particularly crucial as it streamlines the design process, enhances accuracy, and allows for easy collaboration among team members. It also facilitates the creation of intricate blueprints, schematics, and prototypes, ensuring that designs meet exact specifications. AutoCAD's versatility extends beyond architectural design; it finds applications in various industries, including manufacturing, aerospace, and automotive. Engineers and designers use AutoCAD to create detailed models, simulate performance, and generate documentation for production. Moreover, AutoCAD's compatibility with other software and its extensive library of design resources makes it an indispensable tool for professionals seeking efficiency and precision in their work. Creating technical illustrations is a critical aspect of fields like Mechanical Engineering and Construction. This includes drafting for items such as Auto Gates and various other products. This process involves employing software tools, not only limited to AutoCAD, but also applicable in a wide array of applications. It's crucial to distinguish these technical drawings from other visual materials like posters. This article particularly focuses on utilizing AutoCAD software on a computer to generate 2D representations of objects and structures. We've devised an instructional approach to teach students how to effectively translate concepts into flat images using this software Computer Basics is a foundational course that introduces individuals to the fundamental concepts of computing. Participants learn about the essential components of a computer system, including hardware, software, and peripherals. They gain an understanding of operating systems, file management, and basic troubleshooting techniques. Additionally, the course covers topics like internet navigation, email communication, and basic security practices. the Ranking of Introduction to Computers and AutoCAD of Final Result in Computer Essentials is got the first rank whereas is the Advanced AutoCAD is having the Lowest rank.

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