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Teaching Dimensioning in AutoCAD in Multimedia and Computer Design Studies: A Technical Communication Perspective

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Abstract. The article presents a study based on a deep interdisciplinary approach that integrates perspectives from communication studies, educational sciences, and the subject discipline. The study also relates to the field of engineering education, which is highly relevant for universities with a technical profile. Using the case study, the research clarifies the students' understanding of dimensioning in technical drawings and identifies key didactic aspects of technical communication. The study demonstrates how tools of technical communication, i.e., specifically dimensioning in AutoCAD, can be purposefully applied to teach the logic of structuring engineering information to students of Multimedia and Computer Design (MCD). Rational and purposeful dimensioning fosters students' critical and creative thinking, their ability to select essential information, and their responsibility for clear communication of information to another user. Understanding that redundant dimensions should be avoided helps students prevent duplication of information and encourages them to focus on functional relationships between geometric elements.

Keywords: engineering graphics, technical communication, learning process, students of Multimedia and Computer Design.

1. Introduction

Graduates of the study programme Multimedia and Computer Design (MCD) are often perceived as being primarily oriented toward visuality or creativity. However, more frequently, they work in interdisciplinary teams where precise communication of engineering information is essential. Even visually appealing designs lose their value if they cannot be correctly understood or interpreted in the production process. For MCD students, learning dimensioning often presents a challenge, as they tend to focus on a visual form rather than on the functional logic of dimensions and their relationship to manufacturing. Knowledge of targeted and structured dimensioning can have broad applications in industrial design, architecture, robotics and mechatronics, 3D printing, and other fields. The ability to apply structured and precise dimensioning not only enhances the professional competitiveness of MCD graduates but also serves as a crucial first step toward participation in real engineering projects. Therefore, teaching engineering drawing based on critical thinking can serve as a tool for fostering functional logic, manufacturing awareness, and technical communication skills. A common challenge arises from the insufficient understanding that dimensioning refers not only to a graphical element but also is seen as a means of conveying engineering information. Synthesising multiple scientific perspectives, Garrison (2014) argues that technical communication is based on three interrelated theoretical approaches: 1. instrumentalism, 2. critical humanism and 3. user-centeredness. *The study presented in this article* analyses dimensioning at the intersection of these dimensions: formal rules (instrumental dimension) are interpreted by students (humanistic dimension) and evaluated based on their clarity for another user (rhetorical dimension). Garrison (2014) emphasises that the essence of technical communication lies both in the application of technological rules and in their rhetorical mediation to the user. This perspective allows dimensioning to be understood as a communicative process rather than as an isolated drafting activity. In this context, rhetoric in technical communication is not about persuading the recipient, but rather about presenting information in a way that it can be understood *without additional context*. Consequently, the educational aspect of technical communication becomes significant, as it aligns academic studies with the realities of the professional market. At the same time, it is important to highlight not only the production of technical documents but also the development of creative and critical thinking (Russell, 2007). This can be nurtured in the study process through work-related scenarios that encourage students to solve complex problems (Cunningham and Steward, 2011). In the process of technical communication, both participants, that is, the document creator (message sender) and the recipient, play a critical role. According to Dessie et al. (2024), technical communication teaching focuses on developing creative thinking, technical writing, oral presentation skills, and document comprehension. Students in the Multimedia and Computer Design (MCD) study programme do not study the fundamentals of engineering, which necessitates a different teaching and learning approach. Even when formal requirements for dimensioning are presented, MCD students, who lack experience in manufacturing, assembly, or in the context of technical communication for encoding and decoding information, often perceive these requirements as isolated rules rather than as components of an interconnected system for transmitting engineering information. As a result, dimensions may be applied correctly formally but still remain structurally nonfunctional, complicating the decoding of the drawing for another user. This problem highlights the gap between the declarative knowledge of rules and the ability to apply them critically as a means of conveying engineering information. Therefore, it is essential to cultivate MCD students' ability to structure dimensions according to function, rather than purely arranging them for aesthetic or visual appeal.

2. Literature overview

The origins of technical communication date back to the middle of the 20th century, when engineers were trained to produce documentation for hazardous technologies. As technologies advanced and diversified, the concept of technical communication expanded, with a growing focus on communication about technology and human interaction with it. International communication, online communication, and design are fields that have further broadened the scope of technical communication. The primary goal of technical communication is to ensure that technology users can effectively access and apply information tailored to their needs and specific usage contexts. Consequently, in the process of technical communication, the key participants are the user and the audience (Carradini, 2020). Scientific literature emphasises the role of technical communication specialists in supporting diverse user groups, particularly those who encounter difficulties when using self-service documentation (Cleary and Flammia, 2012).

Thus, both academic and applied research studies highlight that technical communication includes not only writing or documentation, but also building of user experience, structuring of information, and ethical aspects of presenting information. Therefore, an important challenge is to prepare specialists who are capable of conveying technical information in both written and oral form in professional contexts (Luo et al., 2022). According to Luo et al. (2022), three main clusters of technical communication skills can be distinguished: technical writing, oral presentation, and team communication. However, the specific sub-skills of technical communication may vary depending on different conceptual approaches. For this reason, research on technical communication frequently demonstrates a strong connection with pedagogy (Rude, 2009). Technical communication teaching and its growing importance indicate the emergence of a new generation of professionals capable of applying technical and non-technical problem-solving strategies. This strengthens students' understanding that engineering and communication skills are interconnected and mutually beneficial (Williams, 2001).

Engineering drawings are attributed to a form of technical communication (the transmitted message) that enables specialists from different fields to accurately understand and interpret the object being designed. One of the most important elements of such drawings is dimensioning, which makes it possible to specify the sizes of separate elements, their positions, their interrelationships, and their functional parameters (Ghotkar et al., 2025). In technical or graphical communication, a drawing used by professionals from different disciplines becomes a significant medium for conveying information about various objects or for sharing technical information (Sutton and Williams, 2007). In this sense, a drawing can be understood as the language of production (Ghotkar et al., 2025), which has also been described as an international and professional language (Baralić and Bjekić, 2024). Consequently, technical communication competencies that include oral, written, and interpersonal communication skills are essential seeking to effectively convey clear technical information in the professional environments (Jamaludin et al., 2019).

At first glance, it may seem that advances in technology allow for complete reliance on computer software. However, according to Ghotkar et al. (2025), while tools such as AutoCAD and SolidWorks enhance the accuracy of drawings and support faster revisions, the pedagogical dimension remains essential. There is a significant need for training in modern dimensioning practices, both in academic programmes and in professional development in the industry. The emphasis should be placed on **precision, consistency, clarity, and avoidance of redundant dimensioning**. For this reason, the implementation of interdisciplinary feedback cycles is highly recommended**.** As Industry 4.0 has become the norm, engineers are required to possess not only a strong understanding of 2D drawings, but also competency in digital environments that seamlessly integrate design, modelling, and manufacturing data. Research by Martinez-Bravo et al. (2022) highlights the multidimensional nature of digital literacy and calls for development of critical, social, and emotional competencies in addition to technical ones to ensure responsible use of technology. Despite the growing role of digital tools, the importance of technical drawing remains significant. Studies by Baralić and Bjekić (2024) demonstrate that participation in technical drawing courses improves students' perceptual abilities, while complex intellectual abilities (expressed as IQ) are higher after completing such courses than before. Vdovinskienė (2023) stresses the importance of learning technical drawing for the development of certain spatial perception skills. The opportunity to enhance these abilities constitutes an important component in the education of engineering students, contributing to more effective professional communication through technical drawings. Visualization, as a process of engineers' creative activity and as a universal visual language, enables the communication of ideas and information about construction methods or functional characteristics among engineers from different cultural contexts. Furthermore, spatial perception can be developed not only through practice and training, but especially through subject-specific studies (Ogunkola and Knight, 2018). At this point, the importance of interdisciplinary integration becomes particularly evident.

Hence, the importance of training for engineers and drafters, especially for students and novice specialists, is stressed, which focus on developing skills in advanced dimensioning methods. In this context, the role of feedback becomes especially significant (Kusmin and Laanpere, 2025). Establishing feedback cycles with manufacturing and quality control teams enables continuous improvement of dimensioning practices based on real-world production challenges (Ghotkar et al., 2025). To ensure that students develop spatial thinking and drafting skills, it is essential to incorporate reflective processes (Ernštreits, 2024) and teamwork. According to Toma and Neculai (2017), working in groups not only enhances students' social and communication skills, but also encourages them to actively think about and seek ways to help others better understand the subject-specific material. Students develop the ability to comprehend the assessment process and avoid overestimating their own work. Their self-esteem improves as they engage in peer evaluation and integrate feedback into their final outcomes. Importantly, this mode of learning also strengthens the relationship between lecturers and students; students gain a deeper appreciation of the complexity of teaching and develop greater respect for the lecturer's work (Toma and Neculai, 2017). Liu et al. (2025) propose integrating the teaching of technical communication into technical subjects through scenario-based practice, supported by continuous feedback and structured intercultural communication training aimed at reducing communicative and interpersonal differences among team members. Thus, technical communication, which forms the foundation of contemporary technical drawing (as a transmitted message), is essential from the perspective of the drafter (message sender) and the recipient (message receiver) (Fig. 1).

In the contemporary world, where technology is evolving at an incredible pace, various key international documents underline the importance of fostering students' critical thinking, creativity, collaboration, and communication skills, as well as their emotional and social aspects (Martínez-Bravo et al., 2022). Technical communication skills should be developed alongside other skills fostered in the so that students are prepared for the globalized job market (Zhou and Moeggenberg, 2023; Liu et al., 2025). According to Tham (2025), the development of diverse technical communication competencies requires consistent collaboration among lecturers, researchers, and practitioners, integrating theoretical advancement, pedagogical methods, and practical application. It can also be argued that the role of the lecturer becomes particularly significant in the teaching of technical drawing. As noted by Navickienė et al. (2019), one aspect of a teacher's creativity is the development of new methods, which is a process that requires more effective communication, enhances pedagogical interaction, and activates both student and teacher participation in learning activities. In this way, a meaningful connection between communication and educational sciences emerges within the study process: by engaging deeply with students' learning processes, the lecturer not only refines their own teaching methods but also contributes to the development of students' competencies.

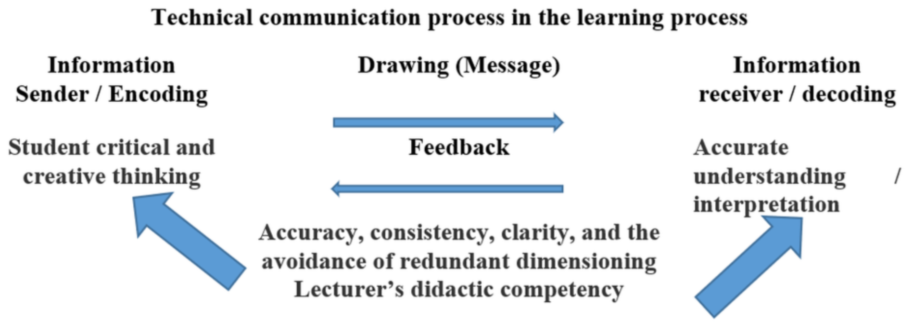


Figure 1. A technical communication model based on the lecturer's pedagogical competency in teaching students of multimedia studies

3. Methodology

A drawing of a logo was selected for the case study as the object of analysis, understood as a creative visual representation with a distinct graphical expression. As a purposeful geometric object composed of clear and elementary forms (lines, circles, arcs), it is assumed that such a task can foster not only the creative, but also the logical and critical thinking of Multimedia and Computer Design (MCD) students. Although a logo is fundamentally a design object rather than a technical component, its technical drawing (encoding) becomes necessary when the logo must be precisely reproduced (decoded), manufactured, distributed, or standardised. For this reason, certain dimensioning and annotation standards may be applied, including angles, distances, radii/diameters, symmetry and reference axes. Thus, the preparation of a logo as a geometric object is directly related to the process of technical communication, specifically to the processes of encoding and decoding dimensions. When adding dimensions, the student encodes information by selecting which dimensions are essential, determining how they should be structured, and deciding which symbols and relationships should be used to convey them. Another user, when "reading" the drawing, decodes this information based on the logic, hierarchy, and consistency of the dimensioning system.

Unlike a technical component, a logo does not follow a predefined engineering model of a "correct" solution and allows to observe students' intuitive approaches to dimensioning, providing an opportunity to evaluate how they structure dimension-related information based on visual perception. The logo drawing presented in this study is not intended to demonstrate dimensioning practices in accordance with ISO 128 and ISO 129 standards. Rather, it is used as a research instrument that enables the analysis of students' spontaneously chosen dimensioning approaches, the principles underlying their decisions, and their understanding of dimensioning as a means of conveying technical information.

The goal of this study is to identify which teaching methods support MCD students in transitioning from the application of formal dimensioning rules (as defined in standards) to their conscious, structured, and functional use, which ensures clear and unambiguous communication of drawing information (dimensioning) to another user.

The participants of the study were first-year, second-semester students enrolled in the Multimedia and Computer Design (MCD) study programme (5 groups of up to 20 students each; total n = 98). The students had acquired the basics of 2D modelling using AutoCAD and possessed general experience in visual design and computer drawing; however, they had no prior training in engineering graphics.

The students were tasked with creating an accurate drawing of a given raster image of a logo (Fig. 2 and 3) using AutoCAD, including dimensioning, in such a way that another user would be able to reproduce it. The students' logo drawings were analysed in two stages: first, an analysis of the drawing process (workflow) was conducted; second, a typological analysis of errors was performed.

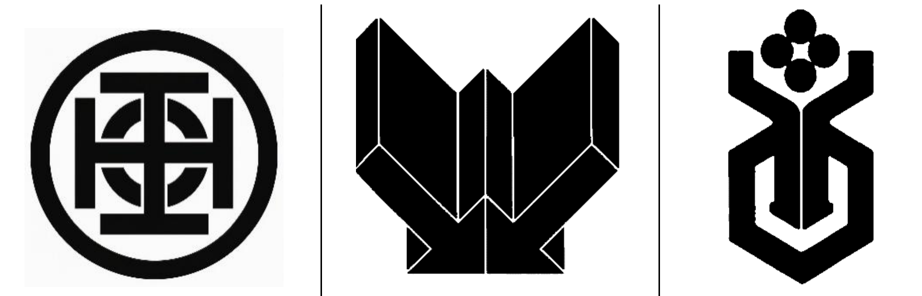
A typological error analysis was used to identify and categorise recurring dimensional annotation violations, such as duplicated dimensions, creation of closed chains, incorrect diameter or radius markings, and improper application of symmetry axes. This approach allowed for the identification of the most frequently occurring error types and their distribution across students' work. Additionally, other interrelated analytical methods were applied. A qualitative drawing analysis was used to assess the overall dimensional structure, hierarchy, and visual clarity. The analysis examined how students organised dimensional information within the drawings, whether dimensions were logically interconnected, and whether the provided information allowed for an unambiguous interpretation of the logo's geometry. An interpretive analysis of requirements was conducted to evaluate how students understood and practically applied the formally provided dimensional annotation standards. During the analysis, formally declared adherence to the rules was compared with their actual implementation in the drawings, aiming to reveal discrepancies between knowledge of the rules and their functional understanding and application. This approach made it possible to identify which rules were most clearly understood and which were subject to the widest range of interpretations.

4. Research findings. Case study procedure

Even a relatively simple graphic object, which must be produced with precision or adapted for different manufacturing methods (e.g., laser cutting, embroidery, 3D interpretation), requires accurate and unambiguous dimensions. The creation of a logo or other graphic element in AutoCAD is not simply a technical task as it represents the translation of logical organization, symmetry, proportion, and clarity into a visual form**.** Since a logo does not have a strictly defined technically "correct" dimensional solution, the information encoded by different students (i.e., their dimensional annotation systems) may vary. Consequently, it becomes possible to evaluate whether the dimensional information provided by a student is structured in such a way that it can be unambiguously decoded by another person without additional explanations. If dimensions are duplicated, closed chains are created, or axes are used unclearly, the decoding process becomes ambiguous or misleading. Thus, this research context allows for the assessment of how effectively students communicate geometric information through the dimension encoding–decoding process.

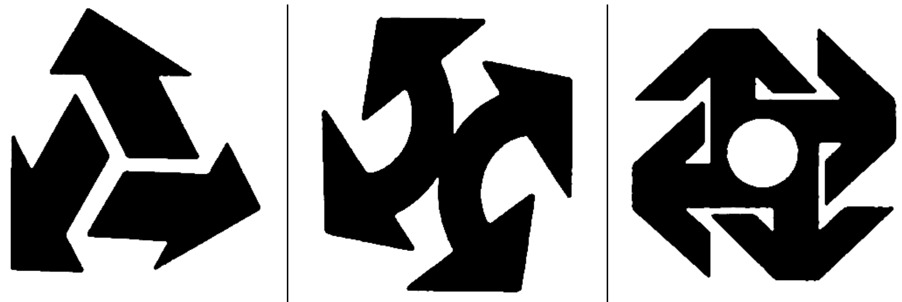
4.1. Analysis of the logo image

Initially, students' general understanding of the task was developed through discussion of 20 different task variants. The submitted logos varied in form: some were symmetrical along two axes (Fig. 2, a), others exhibited symmetry along a single axis (Fig. 2, b and c), and still others were asymmetrical but contained recurring elements (Fig. 3, a, b, c).



a) b) c)

Figure 2. Logos with symmetrical representations: a) symmetrical along two axes; b and c) symmetrical along a single axis



a) b) c)

Figure 3. Logos with asymmetrical representations: a) with three repeating elements; b) with two repeating elements; c) with four repeating elements

During the discussion, students assessed which elements in the representation were repetitive or symmetrical (in which case symmetry axes were drawn) and considered how the repeating elements could be arranged.

4.2. Analysis of the logo drawing and dimensioning process

After the discussion and presenting the requirements without formally explaining them, students were asked to independently annotate the dimensions according to their own understanding. In variant a) of Figure 4, the drawing illustrates how a student marked the dimensions without fully considering the requirements. Although the provided dimensions would allow the logo to be reconstructed using numerous auxiliary lines, it was explained why this approach to dimensioning was incorrect:

- Two identical elements were present, meaning it would be appropriate to annotate dimensions on only one of them;
- The axes were marked as auxiliary lines, even though their intended function is different (Fig. 4., b);
- Excessive angular dimensioning was applied.

Through discussion with the students regarding the dimensioning requirements, dimensions were then annotated in a structured and purposeful manner (Fig. 4., b).

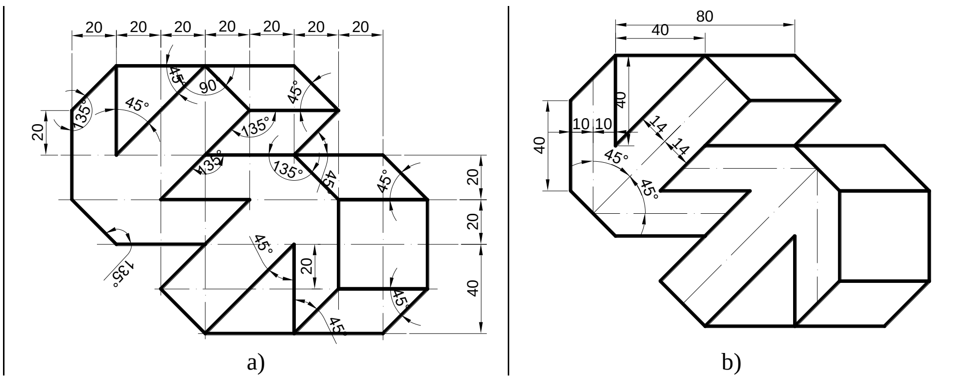


Figure 4.: a) dimensions annotated by the student without considering the requirements; b) dimensions revised according to the requirements, in a structured and clear manner

For students who were assigned a different type of logo task with various arcs or circles (as shown in Fig. 5 and 6), the lecturer's guidance was required not only for dimensioning but also in the beginning to work on the drawing.

In this way, following the lecturer's comments and clarifications of the requirements, the student not only revised the logo drawing but also clearly modified the dimensioning (Fig. 5, a and b). To ensure maximum clarity for another user, the lecturer highlighted additional aspects:

- The drawn lines are not axes of symmetry; it is more appropriate to identify them as auxiliary lines from which the drawing is initiated;

- For clarity, a horizontal auxiliary line may be added;
- Since all four logo triangles (arrows) are identical with the aforementioned auxiliary lines and arcs (the arc lengths are initially unknown), it is simpler to begin the drawing from one of the triangles.

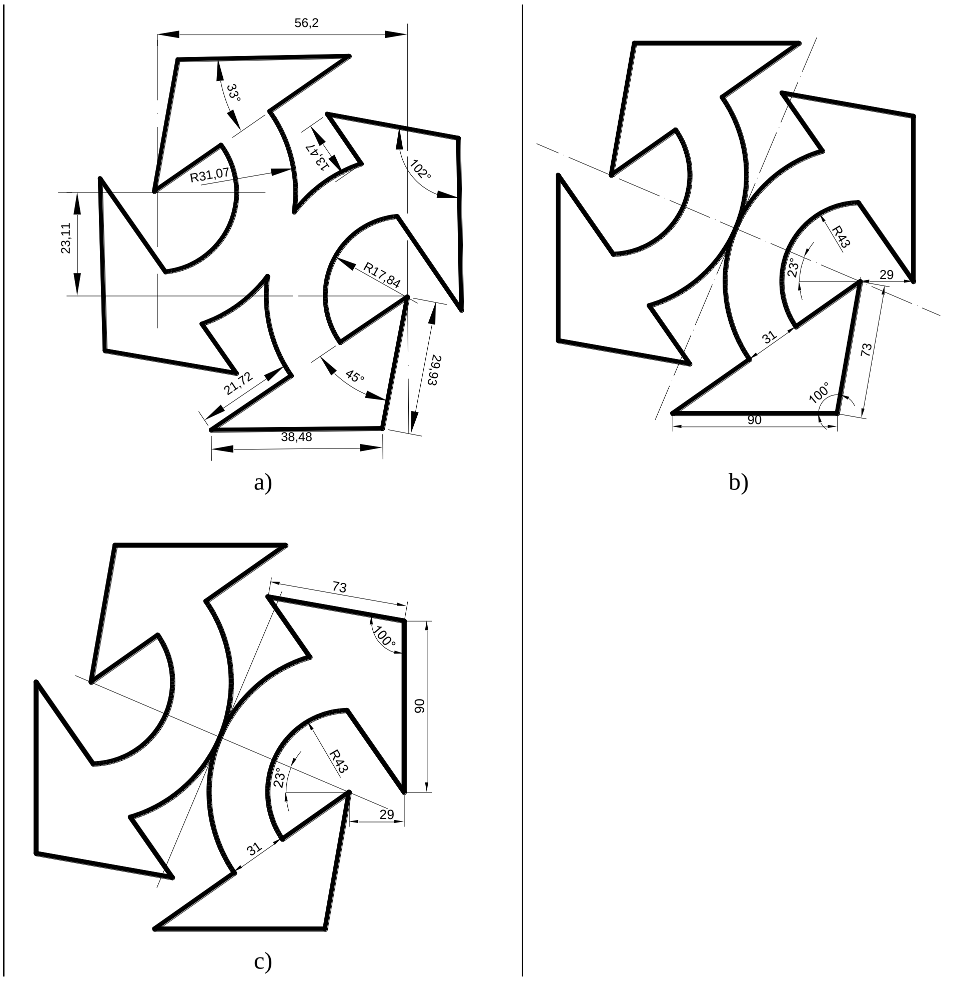


Fig. 5.: a) initial drawing; b) revised drawing with dimensions re-annotated; c) finalized highlights for the completed logo drawing

Some students interpreted the task as requiring a minimalist presentation of dimensions, making it impossible to accurately reproduce their work (Fig. 6). In this student's drawing (Fig. 6a), the initial approach was appropriate: the axes and diameter (90 mm) of the central circle were correctly marked. After receiving guidance on how to draft the logo itself (Fig. 6b and 6c), the student was able to understand and apply the dimensioning practically and independently (Fig. 6d).

It can be argued that when a logo consisted solely of lines, i.e., without circular arcs, students found it easier to comprehend the dimensioning process. When a logo included several arcs (Fig. 6), most students found it challenging even to draft these elements. Although according to technical requirements (as they knew from the first homework assignment), the centre of an arc is typically annotated only when the arc spans half or more of a circle, in the case of the logos it was necessary to mark the centres to ensure that the drawing could be correctly interpreted. For some students, it was necessary to explain not only how to structurally annotate the dimensions but also how to draw or model a particular version of the logo. Therefore, it can be concluded that understanding the overall composition and final results facilitates understanding of the dimensioning process.

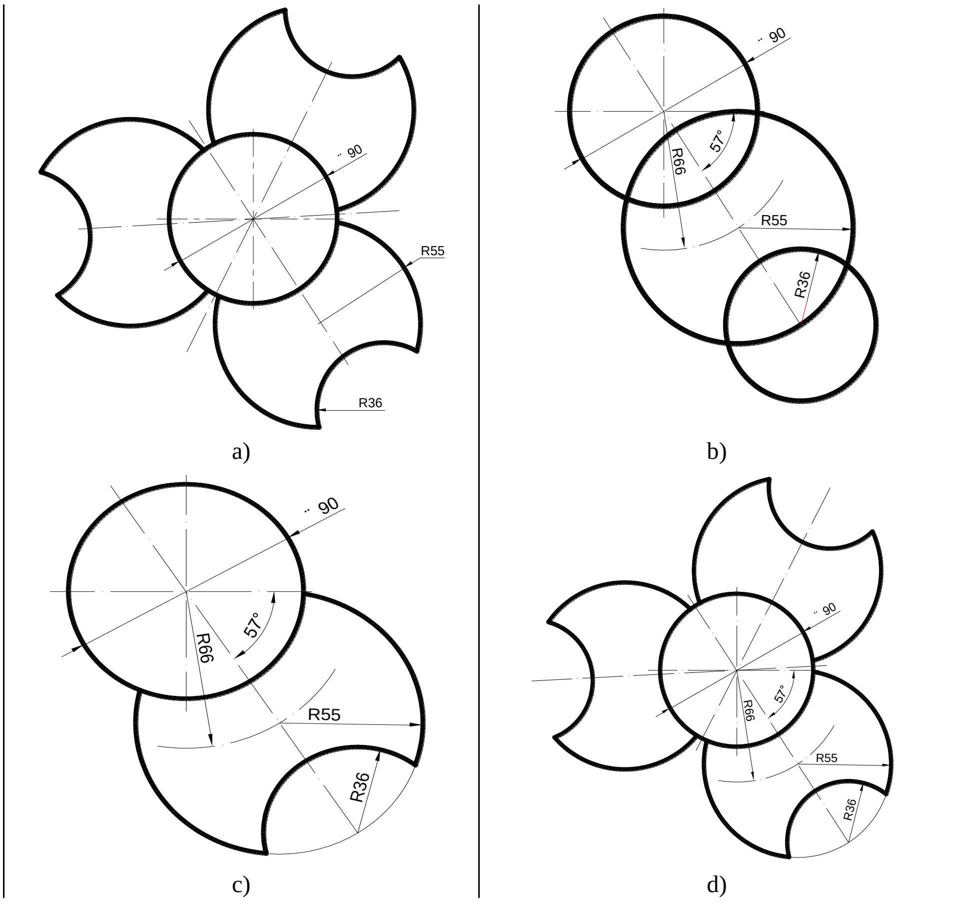


Fig. 6: a) initially annotated dimensions; b, c) lecturer's explanation; d) final drawing

As students develop critical and creative thinking, they must begin with an understanding of the formal requirements. University lecturers should emphasise and explain the necessity of precise and structured dimensioning, including avoidance of duplicated dimensions, the inadvisability and avoidance of closed chains, correct marking of arc centres, diameters, or radii, and the use of symmetry axes. In this context, the lecturer's initial explanation can be combined with students' reflective thinking on their own decisions, challenges encountered, error analysis, and strategies for ensuring clarity of information transmission in subsequent drawings. The principle of feedback in technical communication can also be incorporated. When working in pairs, students can provide each other with feedback on the accuracy, consistency, clarity, and avoidance of redundant dimensions in their logo drawings. Such a methodology could help MCD students better understand dimensioning as a communicative process rather than merely adherence to formal rules. Discussion, error analysis, reflection, and peer feedback create conditions for students to perceive dimensioning as a structured system of information transfer.

4.3. Typological analysis of errors

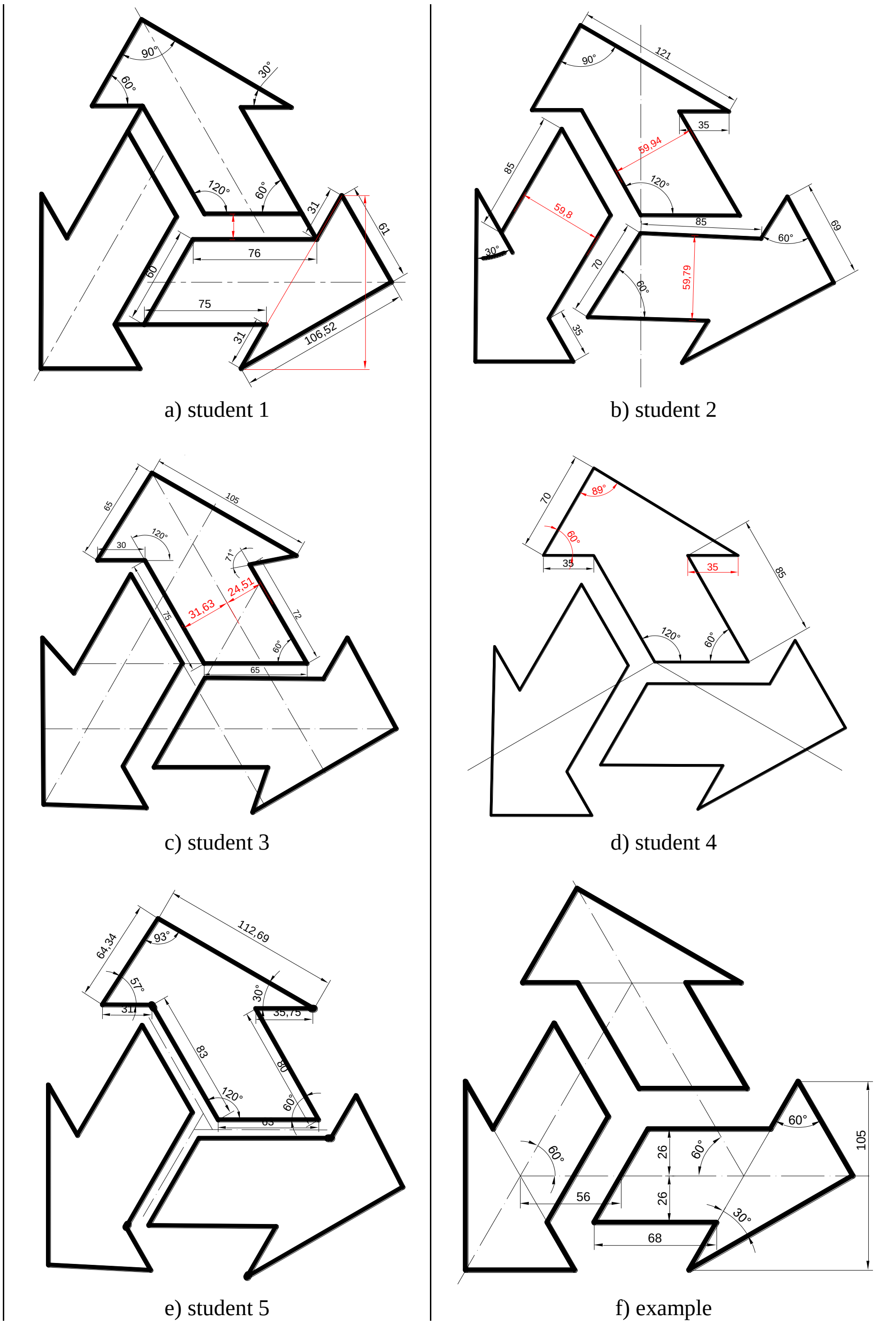
The collected student works were analysed according to pre-established assessment criteria: adherence to requirements, structuring of dimensions, completeness of dimensions, clarity for another user, and consistency of the encoding–decoding process. Adherence to requirements included the application of specified rules, such as avoiding duplicated dimensions, preventing closed chains, correctly marking arc centres, diameters, or radii, and using symmetry axes appropriately. Structuring of dimensions assessed the hierarchy of dimensions and their interrelationships within the drawing. Clarity for another user indicated whether the provided information allowed the logo geometry to be unambiguously reconstructed, that is, whether any dimensions were missing. Consistency of the encoding–decoding process evaluated whether the students' chosen dimensioning structure constituted a coherent system that could be interpreted without ambiguity (Table 1).

Although the primary focus of the task was on dimensions, a considerable number of students created the logo drawings without adhering to the fundamental 2D modelling principles learned in AutoCAD, namely, accurate geometry. Therefore, the C4 criterion was intended to draw students' attention specifically to the principles of 2D modelling.

Table 1. Assessment criteria for student work

Assessment criteria	0 points	1 point	2 points	3 points
C1. Adherence to requirements (rules)	Requirements are not applied or are applied incorrectly	Only isolated requirements are applied	Only the main requirements are applied	Requirements are applied consistently and without significant errors
C2. Structuring of dimensions	Dimensions are arranged chaotically, without a clear structure	Dimensions are partially structured but illogical, lacking hierarchy or relationships	Dimensions are logically structured with a clear hierarchy	
C3. Clarity for another user	The drawing is unclear, more than half of the additional dimensions are needed	The drawing is only partially understandable	The drawing is clear and unambiguous	
C4. Consistency of the encoding–decoding process	The drawing information is fragmented and ambiguous	The drawing is disorganized, disregarding the principles of verticality and horizontality (orthogonality); elements are copied inaccurately	The drawing contains minor errors	The drawing is accurate and free of errors

The logo task presented in Fig. 7 was completed by students from five different groups of the MCD study programme. The figure illustrates how students interpret dimensioning requirements in different ways. Since the logo representation does not have a single technically “correct” dimensioning solution, and alternative solutions are possible even among engineering professionals (one such solution is shown in Fig. 7f), these examples allow for the comparison of individual dimension encoding approaches and the evaluation of their clarity and consistency.



a) student 1 b) student 2

c) student 3 d) student 4

e) student 5 f) example

Figure 7. Examples of dimensioning errors in student logo drawings

A typological and qualitative analysis of errors in five students' works is presented in Table 2.

The data presented in Table 2 indicate that formal adherence to dimensioning requirements alone does not ensure either clarity or informational coherence of a drawing.

Table 2. Comparison of student work results according to assessment criteria

Student	**Criterion**				**Short clarification**
	C1	**C2**	**C3**	**C4**	
1	2.7	1.5	1.8	3	A minor error in the geometry of the element. Redundant dimensions are present; they should be indicated on only one of the three identical elements. The distance between identical elements is missing; it would be more appropriate to use linear dimensions.
2	2.7	1.5	0.5	1	The axis has no defined purpose. There is redundancy in several dimensions; they should be indicated on only one of the three identical elements. The geometry of the constructed elements is inaccurate. Distances and relationships between identical elements are missing. It is entirely unclear to another user where to begin constructing the drawing.
3	2.5	2	1	2.5	The parallel lines are not actually parallel, indicating that the angles have been dimensioned inaccurately. Axes are used improperly. The geometry of the element is unclear or dimensions are missing.
4	1.5	0.5	2	3	The dimensions provided are appropriate; however, there is a significant lack of them.
5	2	1	1	2.5	Axes are used improperly. Parallel lines are not parallel, indicating inaccurate angular dimensioning, and there is an excess of dimensions. Distances and relationships between identical elements are missing.
Example Fig.4, f)	3	2	2	3	An exemplary logo drawing created by the lecturer, including axes and dimensions.

Some students applied the rules correctly; however, their work lacked proper structuring of dimensions and a clear hierarchy. In terms of clarity for another user, it was observed that visually well-organised and uncluttered drawings are often easier to interpret, yet they do not always provide sufficient information for accurate reconstruction of the object. Meanwhile, the analysis of encoding–decoding consistency revealed that in some cases dimensions were presented in a fragmented manner, rendering the geometric information ambiguous. Therefore, only the combined consideration of all four criteria, which include adherence to requirements, structuring of dimensions, clarity for another user, and consistency of the encoding–decoding process, allows for an adequate assessment of students' ability to use dimensioning as a means of information communication.

5. Conclusions

1. The study results revealed that MCD students' difficulties in applying dimensioning requirements arise not from the complexity of the rules themselves, but from a lack of understanding of them. The selection of a logo drafting task highlighted a fundamental distinction between visual clarity and informational accuracy. Even if students' drawings often appeared orderly and esthetically consistent, they frequently lacked the structural logic necessary for unambiguous decoding. This indicates that in a design context, visual thinking does not automatically translate into the structured representation of technical information. For this reason, dimensioning instruction in MCD studies becomes an effective link between design and engineering thinking, enhancing student preparedness to work in interdisciplinary environments where technical communication is a critical professional competency.

2. The findings also demonstrated that presenting formal dimensioning requirements, without contextual explanation or supplementary guidance, is insufficient to ensure a correct and consistent application in students' work. Students often applied the rules fragmentarily, without understanding their function as a system of information transfer, leading to structural and communicative errors in the drawings. The study confirmed that dimensioning in MCD studies must be understood not merely as a technical drafting procedure but as a process of technical communication that includes the encoding of information (by the student), the message itself (the drawing), decoding (by another user), and feedback. Integrating a technical communication model into the teaching process enables systematic development of students' critical and creative thinking, responsibility for the accuracy of transmitted information, and the ability to evaluate drawings from the perspective of the recipient. In this way, the study process merges the aspects of communication and educational methodology.

3. In visual design studies, formal rules alone, without a functional rationale, are insufficient. It further emphasises that the quality of dimensioning should not be evaluated in isolation, but through the lens of encoding–decoding consistency. This represents an important didactic consideration for lecturers designing engineering graphics teaching methodologies for students from non-engineering study programs. Instead of simply transmitting standards, it is recommended to focus on situational examples, error analysis, and multiple user perspectives, key aspects of technical communication grounded in lecturer explanations.

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