

Learning by Drawing in First-Year Design Education

Firat Küçükersen^a, Fatma Pınar Özemir^b

^aDepartment of Interior Architecture, Faculty of Architecture Istanbul Technical University Istanbul, Turkey

^bDepartment of Industrial Design, Faculty of Architecture Istanbul Technical University Istanbul, Turkey

Keywords: Drawing, Learning, First-Year Design Education, Freshman Student, Design Studio

Abstract Approaching drawings only within the framework of representation and visual language notions may suggest a rather limited scope that emphasises only the internal thinking and representational aspects of drawing. Therefore, within the scope of this study, drawings were handled as a visual and verbal-based education and learning tool where students could approach their ideas critically. On-going dialogue between drawing and students, which includes critical thinking and research, can be defined as a kind of interaction in which students can argue with themselves using lines, and it has content about the individual and the produced representation. Another form of interaction is related to the understanding of design students and instructors as well as the effective communication between them. In this context, the research starts an argument in the light of written and visual data on how drawing can contribute to the education process by revealing some clues about the function of lines in the first-year design studio as a learning tool, and how students perceive, employ and may use the act of drawing.



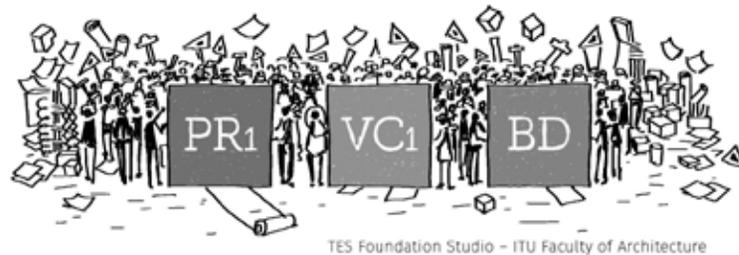
Introduction

It is necessary to provide environments in which students can fulfil their responsibilities, develop autonomous thinking mechanisms, and pose new questions rather than just answering questions, instead of futile attempts to transfer knowledge in the design studio as is the case in the educational field and in the learning activities, which is essentially multi-representational (Brooks & Brooks, 1999: 13; Ainsworth & Scheiter, 2021: 61). For this purpose, this research discusses how the line as a kind of language may be included in first-year design education and how it can contribute to the studio operation and act of learning. Therefore, this paper emphasises the features of drawings that are generally regarded as an integral part of artistic and creative activities, not as tools that directly reveal what is in the mind but that change and transform the ideas and perspectives of learners. In this respect, the research was conducted based on literature reviews, observations conducted in the first-year design studio through authors' field notes, and visually produced discourse aims to discuss how lines can be used to analyse and interpret information in the first-year design studio. Within the scope of this study, the act of drawing is considered an educational tool rather than a description (Edwards, 2008: 7) and brings up a discussion on how to create thinking environments that will enable students to internalise and construct knowledge. Therefore, this research approaches the interactions of students with the design action and process rather than their final products by drawing a visual perspective in the context of thinking and learning.

Method

In addition to the literature reviews on design pedagogy, first-year design studio, and drawing language, this study was carried out based on experience and data obtained through ethnographic approaches, including attitudes of students, discourses, and field notes of researchers taken as a participant-observer in the 2021-2022 fall term Foundation Studio consisting three first-semester studio courses, namely Project I, Visual Communication I: Visualization and Technical Drawing, and Basic Design and Visual Arts in the Faculty of Architecture at Istanbul Technical University (ITU). The research notes and related quotes were visualised by the two researchers that conducted this study, making it possible for them to see how the drawings and perspectives on the same subject differ. Within this methodological framework, this paper aims to reveal the purpose of students in using the drawing in their design and learning processes and how drawings with visual and verbal basis can and may play a role in the design studio.

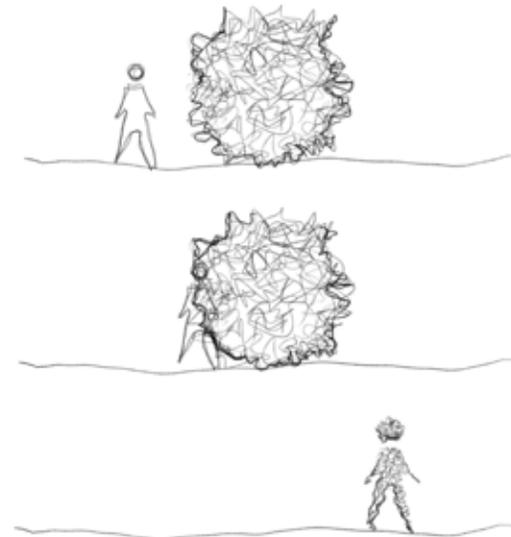
During the studies that the students have done throughout the term, some titles/themes,



in other words, thick descriptions of the design process, learning and drawing action of the students, were obtained through the diary entries, including their views and discourses on the design processes and the drawing action, as well as the dialogues and discourses they have established with the educators and their peers. Instead of proceeding to the analysis process after the obtained observations, the analysis stage was integrated with the observation stage. In this context, conducting field research based on ethnomethodology, which is interpretive and helpful in revealing the relationships among observations as well as the detail of observations (Dourish, 2006: 543), documenting the discourses, attitudes and connotations, and establishing some connections among the data is considered as an analysis phase (Crabtree et al. 2012: 112-130). Within the scope of the study, the analysis was applied not as a final activity after data collection but as a simultaneous step that was carried out by being included in the design studio and penetrated the observations, field notes and reflections of the authors. Therefore, the analysis process was not considered a separate activity from the ethnomethodological fieldwork. The analysis and data synthesis process started in the design studio as an action intertwined with the fieldwork conducted in the studio environment through participant observation four days a week. Thus, comprehensive data sets were able to be revealed during the field research.

First-Year Design Education

The educational process which has two main aspects, namely, psychological and sociological, is a phenomenon based on social progress and reforms. It has meanings beyond being a preliminary preparation for future life or professional career (Dewey, 1897). Within this broad definition, design education includes ambiguous processes with ill-structured rather than clear and infallible truths in which many reasonable solutions and suggestions can be put forward (Goldschmidt, 2017: 77). Hence, the experiences of first-year students and the knowledge they have gained in their past education may be insufficient in generating ideas against the complexity mentioned above and unclear situations. This research which does not aim to question the education they received



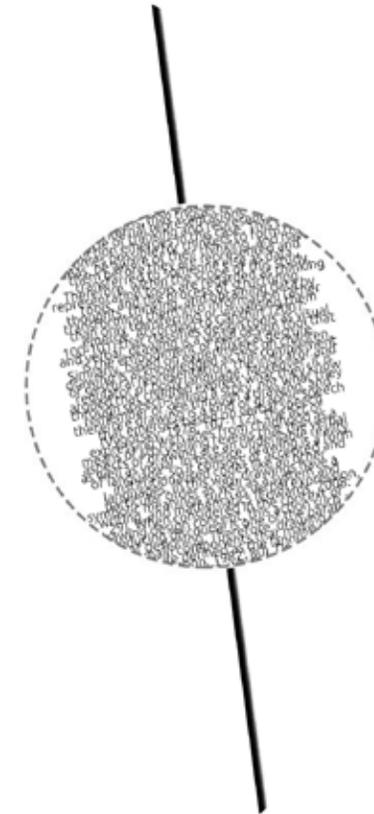


preceding their undergraduate degree or to criticise the problematic situations encountered, analyses the complex situations that arise in design studios and focuses on the perspectives of students on the design action and presents some clues in terms of turning the current phenomena in their favour within the framework of the dialectical connection of tool-thinking and drawing-learning relations.

Students' meeting with the design concept can be defined as chaos, but it need not be forgotten that as Gray and Malins (2004: 97) stated, it is impossible to produce, internalise, and construct knowledge without chaos. The chaos, in other words uncertainty that first-year design students encounter is not only based on some hard-to-solve problems arising from the nature of design but also on learning processes that focus on critical and creative thinking based on design studio function and culture and the challenging processes caused by this situation. At this point, students need various tools and thinking methods to understand the complicated and firstly encountered situations they experience and to offer solutions since the way to solving a problem also determines the content of a solution. In this vein, considering the act of representation which "makes us human" (Fosnot & Perry, 1996: 25) and is accepted as an integral part of human nature, the context of design education can be considered as an essential step for students to comprehend the notions of design and learning.

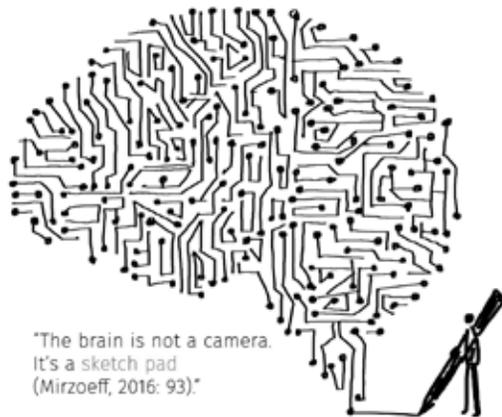
Nature of Drawing in Design Education

Representations are evaluated under two headings as external and internal (Goldschmidt, 2017: 78). Every internal representation can be externalised by using tools. The created objects, or external representations, may trigger the creation of various internal representations. Hence, a vast cycle of thinking and representational production emerges in this case. This way it becomes possible for thinkers to form their ideas, be aware of their thinking, and have them before they are represented and transferred to someone



else as data. Therefore, within the scope of this study, representation tools are regarded as thinking tools, and the process of structuring thoughts, thinking, and obtaining data by transforming them into information rather than only transferring or visualising them emerge.

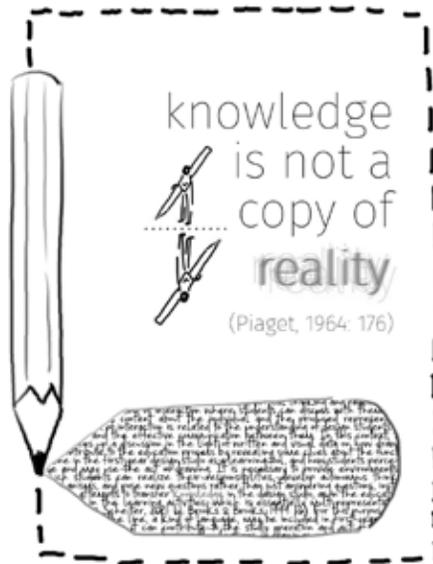
According to Gänshirt (2007: 100-101) that classifies design tools as visual and verbal, drawing is a visual design tool that is the embodiment of physical gesture. Similarly, based on experiments on children, drawing is acknowledged as the complement of gestural representation, the indicator and regulator of body language. Moreover, it is argued that children express what they know through speech-telling a story, not what they remember or see through a drawing, and therefore drawing is a kind of graphic speech that emerges based on verbal speech (Vygotsky, 1978: 107-112). The act of expressing with lines



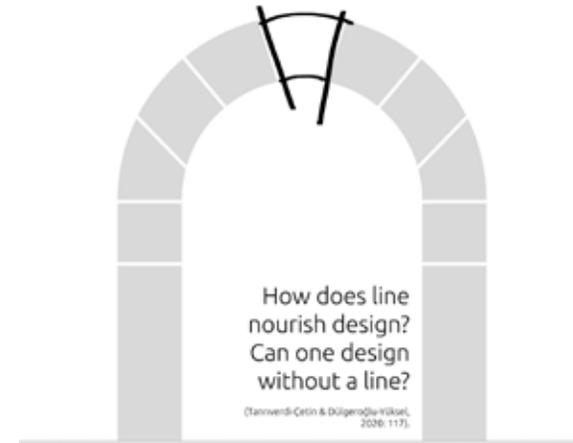
"The brain is not a camera.
It's a sketch pad
(Mirzoeff, 2016: 93)."

from childhood as a means of story-telling reveals that the verbal aspects of drawing are an undeniable reality as well as visual. In essence, drawing is a form of language, so it consists of accepted and institutionalised codes like all other languages. In this way, drawings have a particular order as well as a system and symbolic meanings such as verbal expression, writing, and mathematics (Edwards, 2008: 29). When considered in the context of drawing design concept, this action such as producing discourse is one of the parallel ways of designing. Therefore, drawing is one of the main components that make up the structure defined as the language of designing (Schön, 1983: 80).





Drawing in the design process, which is not only a problem-solving action and primarily includes various cognitive activities (Lawson, 2005: 285), is considered as a private action state as a fundamental tool for students to produce alternative solutions to design problems and to synthesise the data they have obtained (Goldschmidt, 2017: 83). Thinking and ideas produced on the paper surface allow design students to argue with themselves as a reflection of their point of view because all images produced on paper are open to transformation, not as precise and clear discourses, thanks to the mode of drawing, which makes it possible to grasp and abstract geometry (Gänshirt, 2007: 137) exist as variable and interpretable representations. In this vein, drawing goes beyond being coded or frozen ideas or visual compositions on paper (Tanriverdi-Çetin & Dülgeroğlu-Yüksel, 2020: 127).

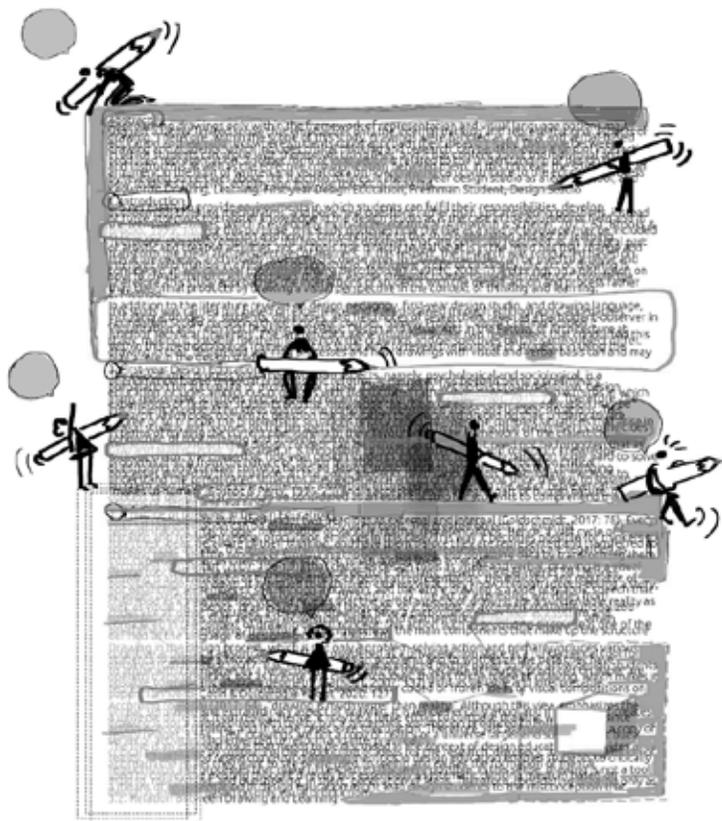


According to Purini (2017: 64), “drawing is much vaster than reality.” Although this view emphasises the unreal, surprising and extraordinary aspect of drawing, it is fundamentally a tool and medium that creates a universe different from reality. Hence, it may be a futile effort to compare drawing with reality since drawing is not a competition with reality but a systematic assumption produced to form reality, action-oriented thinking, and in some cases even speculation. Therefore, just as knowledge is not a copy of reality (Piaget, 1964: 176), drawings are not a copy of reality or a universe larger and superior to it but a series of activities implemented to reform and interpret reality.

The line is an essential issue that needs to be discussed in the context of design education. It provides a critical perspective by supporting the production of ideas for the research, discovery, and interpretation of reality. Thinking and researching using drawing methods in design education enables students to critically approach the issues they want to see or are used to seeing and causes the formation of mental relationships and processes that make (un)expected discovery possible. In this sense, drawing is not a tool used to convey the existing thought directly but essentially a systematic thinking medium based on making, researching, and questioning, in short, generation of ideas. Therefore, considering drawing only as a means of representation in design education might lead design students to the misconception that design is an action based on only visual production.

Relation Between Drawing and Learning

It can be argued that the design language of current practice and education has been predominantly composed of 2D representation since the Renaissance. In this context, it is crucial to address and reveal the close relationship between the concepts of drawing and design that are used interchangeably in some cases under the concepts of education and learning. Although it is an undeniable reality that drawing is at the centre of the action of design, drawing, in essence, does not mean designing because the experience and fluency that students gain in drawing cannot replace having an inquiring and critical thinking mind (Ching, 2016: 199). The insistence on accepting drawing as one of the main subjects in the design studio is not for them to gain fluency in the act of drawing but for the students to construct an inquiring perspective that encompasses their entire life as well as their education life and prioritises research.



Drawing is an action in which the mind, eye, and skin function simultaneously and corresponds to their basic needs such as producing discourse, reacting, and representing. Therefore, this essence of drawing can be argued that it preserves its presence in the act of design, and drawing to design is primarily caused by natural, human, and internal triggers (Ching, 2016: 5). Similarly, design is inextricably linked to the creative activities of the body, craft, intuitive, implicit, sensory and emotional approaches as well as some abstract intellectual processes that take place in the mind (Uluoğlu, 2000: 35). Therefore, drawing can be used to develop, concretise, and reveal data that is difficult to convey verbally or in writing, and it could be considered a fundamental action that enables students to realise, develop and represent their ideas. In this way, students can critically evaluate their ideas by arguing them with themselves and seeing them in several variations, both tangible and intangible. The critiques that students develop on paper about their thoughts and ideas can be defined as a developmental process in which ideas are classified and tested. Compositions created this way serve as external memory which records short-term mental images for design students (Goldschmidt, 2017: 83), and thus, besides recording ideas, they can be developed, and students can create external and internal discourses by rethinking the documented data.

Findings: Experiences and Observations on Drawing in First-Year Design Studio

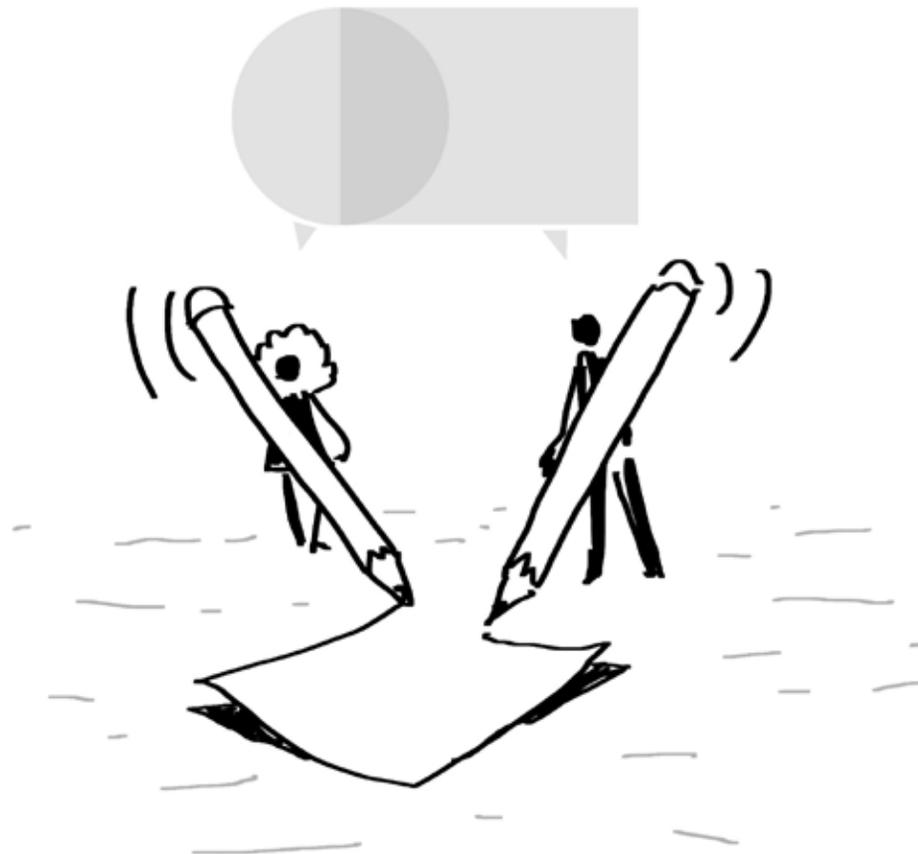
Thanks to the observations made by the researchers in the 2021-2022 fall semester studio and the data transferred to the digital environment in the form of a diary after each lesson, the attitudes of first-year design students towards learning and drawing were classified, and common discourses and perspectives were determined. The analysis of the diaries was handled qualitatively rather than quantitatively to reveal the students' attitudes and views, and a pattern was obtained regarding the drawing experiences of first-year students. Thus, it is aimed to produce unpredictable implicit knowledge by classifying the data documented through the participant-observer role and diaries and to produce a comprehensive framework that refers to actions and interactions rather than attitudes specific to a particular education community (Crabtree et al. 2009: 887; Murphy & Marcus, 2013: 262).

Avoiding “Making a Mistake”

Based on the observations made in the first-year design studio, the first-year design students can be argued to have a general misconception that the project is a phenomenon that begins in mind and is completed as internal thinking and then externalised as it is. The effort of the students to explain and convey their project verbally using their body language includes some intentions such as getting approval and starting production after realising whether they are on the right track or not. The fact that educational backgrounds of students are predominantly successful in the former years before they entered the university system, that they are worried about being successful, and that their products and efforts will be wasted, being afraid of “making mistakes” and the assumptions and concerns they have developed in this direction may be determined as obstacles to thinking as well as producing and applying the logic of trial-and-error with the design tools. In this context, the attempt to get approval from the educators in the first-year design studio without discussing with themselves and without critically approaching their opinions on paper can be considered a reflection of this concern. Therefore, the intention and effort to reach the final product in the first move without experiencing the trial-and-error process and thinking through the line is one of the central attitudes that need to be changed in first-year design education.

Thinking without Tools

It is a very problematic situation, especially within the scope of first-year design education that students think only on their working desks without producing in any way and without being in action during studio work. Indeed, thinking and thinking by using design tools and media, in other words, producing, are two different actions. The act of drawing which is dependent on body movements can be argued that it is an essential intellectual trigger in terms of producing discourse in design and reaching different perspectives through the kinaesthetic properties of the human body. In this vein, students need to realise that their experiments with materials and lines are a kind of thinking action. Therefore, the act of drawing which encourages and paves the way for thinking can be defined and applied as a learning activity in design education in the context of thinking and producing.



Drawing in the Context of Design

Looking at an object and looking at it by drawing are different actions. Similarly, although drawing and drawing for design have similarities in action, they require different cognitive processes because individuals who draw on the paper surface not only reflect what they see but also their perceptions and understandings of what they see (Ching, 2016: 16). Therefore, the intentions and purposes of the design situations naturally make the drawings have a different function. As Goethe puts it, “the eye sees what the mind knows” (Belardi, 2014: 49); addedly, “the eye guides the hand, but the hand has, as it were, a mind of its own (Scheer, 2014: 6).”

That many first-year design students see drawing as a mere talent and manual skill, and that they describe the drawings made during the design process with adjectives such as beautiful, realistic and artistic, and approach the design subject this way can be regarded as a mistake in design education. The fact that Bektaş (2017: 18) thought about his designs only through models for a while in order not to deceive himself due to the immersive effect of drawing is one of the clear examples in this regard. Similarly, to integrate these skills of students that have knowledge and experience in painting and creative activities into design education without hindering their creativity, it is necessary to develop several strategies and studio work related to the unity of design and drawing.

Drawing as Dialogue Between Student and Educator

Acknowledged as a starting point and even a prerequisite for the design action which is defined as an intellectual process (Edwards, 2008: 1) drawing is argued that it expands the discussions, dialogues, and arguments that lead to the emergence of student and educator interaction (Goldschmidt, 2017: 94). The reason for this is that drawing has features that trigger the development of ideas not only of students but also of educators. The data transferred by the students to the paper surface provides essential clues to understand the discourses that they cannot express verbally so that a dialogue environment can be established to determine, expand, and deepen the discussion topics. In a nutshell, drawing in the design studio is suggested to be a common and universal language that constructs the communication between the student and the educator and configures the appropriate environment for the development of their ideas.

Conclusion

According to the findings obtained as a participant-observer, it can be argued that there are some resistances, which can be defined as implicit bias, against the action of learning by drawing by first-year design students. These attitudes are related to the fact that students have some concerns arising from concepts such as right or wrong, the subject of including the body and action in their thinking processes and perceiving the drawings primarily as a means of personal and artistic expression. However, considering drawing only as an action related to the concept of art and creativity or as a way of expressing and embodying personal views and feelings corresponds to only a limited aspect of drawing. Hence,

it is understood that in design education, and especially in first-year design education, drawings need to be considered as a learning tool and medium based on the potentials that trigger inquiry rather than their functions that convey ideas. In this way, it is possible to integrate this fundamental and human activity into the design studio as a way of accessing objective data and constructing knowledge based on learning in the light of basic studio notions such as computation, measurement, evaluation, and critical approach. Therefore, in addition to the features that emphasise creativity, the critical and questioning aspects of line are discussed in the context of first-year design education and included in the design studio which may pave the way for the evaluation and use of this visual language as a medium that enables learning to take place.

Although many researchers and educators agree on drawing features that create and develop thinking, this general acceptance is mainly based on experiential information. Therefore, there is an emerging need for systematically conducted further studies that can reveal the perspectives and experiences of students. That way, it may be possible to reveal the implicit aspects of the drawings in the context of design education and studio culture.

Acknowledgement

The authors would like to thank the 2021-2022 Fall Semester Foundation Studio Instructors Prof. Dr. Mine Özkar, Assoc. Prof. Dr. Sevil Yazıcı, Assist. Prof. Dr. Ethem Gürer, Dr. Feyza Ergün, Begüm Hamzaoğlu, Sevgi Altun, Ali Cankat Alan and Section 2 first-year design students in the Faculty of Architecture at Istanbul Technical University.

References

- Ainsworth, S. E., & Scheiter, K. (2021). Learning by drawing visual representations: Potential, purposes, and practical implications. *Current Directions in Psychological Science*, 30(1), 61-67. <https://doi.org/10.1177/0963721420979582>
- Bektaş, Ç. (2017). *Çizmek*. İstanbul: Arkeoloji ve Sanat Yayınları.
- Belardi, P. (2014). *Why architects still draw*. England: MIT Press.
- Brooks, J. G., & Brooks, M. G. (1999). *In search of understanding: The case for constructivist classrooms*. Virginia, USA: Association for Supervision and Curriculum Development.
- Ching, F. D. K. (2016). *Mimarlık ve Tasarımda Yaratıcı Bir Süreç Çizim*. (Çev: Birkan Ç.) İstanbul: Yem Yayınları.
- Crabtree, A., Rodden, T., Tolmie, P., & Button, G. (2009). *Ethnography considered harmful*. *Proceedings of the CHI Conference on Human Factors in Computing Systems* (pp. 879-888). Boston: ACM.
- Crabtree, A., Rouncefield, M., & Tolmie, P. (2012). *Doing design ethnography*. Springer Science & Business Media.
- Dewey, J. (January 1897). My pedagogical creed. *The School Journal*, 54(3), 77-80.
- Dourish, P. (2006). Implications for design. *Proceedings of the CHI Conference on Human Factors in Computing Systems* (pp. 541-550). Montreal: ACM.
- Fosnot, C. T. & Perry, R. S. (1996). *Constructivism: A psychological theory of learning*. In C. T. Fosnot (Ed.), *Constructivism: Theory, perspectives, and practice* (pp. 8-31). New York: Teachers College Press.
- Gänshirt, C. (2007). *Tools for Ideas: An Introduction to Architectural Design*, Basel: Birkhäuser.
- Goldschmidt, G. (2017). Manual sketching: Why is it still relevant?. In S. Ammon & R. Capdevila-Werning (Eds.), *The active image: Architecture and Engineering in the Age of Modeling* (pp. 77-97). Springer.
- Gray, C. & Malins, J. (2004). *Visualizing Research: A Guide to the Research Process in Art*

and Design. England: Ashgate Publishing Limited.

Keith M.M. & George E.M. (2013). *Epilogue: Ethnography and Design, Ethnography in Design ... Ethnography by Design*, In W. Gunn, T. Otto and R. C. Smith (Eds.) *Design Anthropology: Theory and Practice*, (pp. 251-268), London: Bloomsbury Academic.

Lawson, B. (2005). *How Designers Think: The Design Process Demystified*. England: Architectural Press.

Mirzoeff, N. (2016). *How to See the World: An Introduction to Images, From Self-portraits to Selfies, Maps to Movies, and More*. New York: Basic Books.

Piaget, J. (1964). Part I: Cognitive development in children: Piaget development and learning. *Journal of Research in Science Teaching*, 2(3): 176-186.

Purini, F. (2017). Elementary observations on drawing. *Disegno*, 59-72. <https://doi.org/10.26375/disegno.1.2017.8>.

Scheer, D. (2014). *The Death of Drawing: Architecture in the Age of Simulation*. London: Routledge.

Schön, D. A. (1983). *The Reflective Practitioner: How Professionals Think in Action*. New York: Basic Books.

Tanrıverdi-Çetin, Ç. T., & Dülgeroğlu-Yüksel, Y. D. (2020). Tracing the hidden dimension of line in architectural representation. *A/Z ITU Journal of the Faculty of Architecture*, 17(1), 115-128. doi: 10.5505/itujfa.2020.78800.

Uluoğlu, B. (2000). Design knowledge communicated in studio critiques. *Design Studies*, 21(1), 33-58.

Vygotsky, L. S. (1978). *Mind in society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.

