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Back to basics in landscape architecture pedagogy through collage and model-making: a qualitative study in Korean basic-level design education

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ABSTRACT

Rigid and conventional drawing training is unfamiliar to first-year Korean students who generally complete natural sciences in Korean high school. This study uses a qualitative case study of a Korean landscape design studio to examine approaches to improving the academic performance of Korean basic-level landscape design studios by actively using collage and model-making as pedagogical tools for generating creative design ideas. First, I used a literature review to scrutinise the significant roles of various types of hand-drawing, which informed the design of an alternative studio program, which I implemented. This changed the conventional order of the design studio process to encourage students to use landscape collages and models as creative design ideation and development tools. These tools were effective for understanding a spatial sense of scale, creative design ideation, landform study, texture, and materials application. The findings contribute to an alternative approach to Korean and international basic-level landscape design education.

KEYWORDS

Academic performance; alternative pedagogical approach; basic landscape design studio; collage drawing; landscape model

Introduction

Landscape architects consider visualisation techniques as important instruments for landscape design. As noted by several scholars of landscape architecture, visual representation needs to be prioritised for design visions to be realised (Corner, 1992, 1999; Kullmann, 2014; M.-J. Lee & Pae, 2018). The old English *landskip* first referred to not a physical landscape, but to a painting of it: thus, landscape and representation are inseparable (Corner, 1999, p. 153). The history of design drawings in landscaping can be traced back to those of the sixteenth-century Italian Renaissance gardens (Giannetto, 2008); since then, landscape architects have treated landscape drawing as a necessary medium to visualise design ideas (Hunt, 1992).

Korean landscape education has long emphasised landscape visualisation. Since the 1970s – when the professional identity of Korean landscape architecture was established – hand and computer drawings for landscape visualisation have been regarded as fundamental techniques in landscape education (M.-J. Lee, 2020). In particular, hand drafting conventions (including plan drafting, sections, elevation, and perspective) have been considered important tools of basic-level landscape education. Recently, during the *fourth industrial revolution*, digital technologies have been strongly encouraged, resulting in a dramatic reduction in hand-drawing classes.

However, this dichotomous way of thinking needs to be revised; hand and computer are different media or technologies. We thus need to focus on the specific techniques using these technologies within the design process (M.-J. Lee, 2017a; M'Closkey, 2014)

Drawing classes within Korean landscape education are inherently problematic in terms of techniques. Korean landscape architects use hand and computer drawing techniques to exclusively depict the appearance of landscapes in terms of resemblance rather than as a design process to generate and develop design ideas (M.-J. Lee & Pae, 2018). In particular, hand-drawing classes mostly consist of drafting techniques (such as the drawing of straight lines and plan drafting, sections, elevations, and perspectives of various types), indicating trees and scenery, and the use of technical drawing tools, including pencils, T-squares, rulers, and French curves (S.-H. Kim, Gwon, & Yun, 2003; Pae, 2016; Sin & Lee, 2000). Drafting training is necessary to understand landscape design at the basic landscape education level. However, several problems persist.

First, this approach to drafting education tends to require complete line accuracy, thereby causing inflexibility in using creative exploration within the design process (A.-Y. Kim, 2010, p. 23). Second, it can render students indifferent to landscape design, as beginners in early grades may misunderstand the professional identity of landscape architecture as the representation rather than the design of landscapes (A.-Y. Kim, 2009, p. 188). Third, and most importantly, the department of landscape architecture is mostly assigned to colleges of science and engineering, which is a glitch in the Korean education system (A.-Y. Kim, 2009, p. 188). Korean high schools have two distinct curriculum options – liberal arts and natural sciences. First-year students of landscape architecture usually complete natural sciences in high school and are hence, unfamiliar with hand-drawing. The increasing drop-out rate of students majoring in landscape architecture raises important issues in Korean education (G.-Y. Lee, 2021a). Moreover, owing to the recent dramatic reduction in student numbers, departments of landscape architecture at Korean private universities are merging, being reduced, or abolished (H.-J. Lee, 2018; Park, 2020). Therefore, following the changing needs of first-year students, Korean landscape architecture educators need to redesign hand-drawing classes associated with basic-level design studios.

Some scholars of landscape architecture have discussed hand-drawings from a design theory and practice perspective (Belanger & Urton, 2014; Corner, 1992, 1999; Kingery-Page & Hahn, 2012; Kullmann, 2014; M.-J. Lee & Pae, 2018; M.-J. Lee, 2021b; Treib, 2008). Except for these scholars, hand-drawing techniques for college education have been insufficiently explored in academia. Recently, composite representations using hand and computer technologies have frequently been published; however, these visualisations are not appropriate for the basic performance level of first-year students and represent the advanced work of graduate students instead (Amoroso, 2012, 2015; Cantrell & Michaels, 2015). Scholars of early childhood and citizen education have studied the educational effects of hand-drawings (Chappell et al., 2019; Khan, Bell, McGeown, & de Oliveira, 2020; Lisewski-Hobson & Watkins, 2019; Sakr, 2018). Moreover, hand-drawn two-dimensional landscape representations – including collage and mapping techniques – have been actively explored, whereas three-dimensional physical model-making is generally addressed exclusively with associated practice (Betsky, 2005; Levy, 1998; M'Closkey, 2013; Rieder, 2008). In carefully considering the Korean education system, Korean educators of landscape architecture need to re-explore the fundamental role of hand-drawing, including collage and physical modelling, together with drafting in basic-level landscape education.

The study addresses the following research questions: What are the desirable roles of hand-drawing techniques, such as projections, collage, and model-making, during a basic-level landscape design process? What problems are associated with the conventional process of hand-drawing techniques in present Korean basic-level landscape design studios? How can Korean landscape educators explore alternative design studios using the desirable roles of the hand-drawing techniques in motivating students' creative thinking as part of design education ensure problem-solving? To answer these questions, I explore the role of hand-drawings in the

basic-level landscape design courses in Korean colleges. A literature review is used to highlight the significant functions and roles of distinct types of hand-drawing – including projections, collages, and physical models – in the design process, thereby discussing inherent problems with basic-level Korean landscape education concerning design and drawing classes. These insights inform the development of a novel design studio as an alternative approach to manage these problems by using various types of drawing. An evaluation is then conducted, using a customised questionnaire to elicit the opinions of students about this class. Finally, the results – including students' design works and a class questionnaire on applying the new teaching method – in which the significance and limitations of the study are placed, are discussed. Furthermore, I discuss findings with the international landscape educational community.

Methods

Methodologically, I chose a qualitative analysis. First, I reviewed the related literature on landscape representation (including drafting, collages, and physical models) to critically examine and fully understand the fundamental roles of distinct types of hand-drawing techniques during the design process within landscape education. Second, I continuously observed the alternative design education process, including the partially completed and final products of the class, to qualitatively evaluate their academic performance and discuss the effects and limitations of this educational approach. Third, a simple questionnaire comprising open-ended questions was completed by students to establish their honest opinions about the new design studio.

In this sense, the three main roles of theory in landscape architecture as described by Swaffield (2002, p. 1) – the instrumental, critical, and interpretative functions – inform this study. Specifically, according to Swaffield, the instrumental theory derives from 'empirical observation as a basis for practical action'; the critical theory 'resists and challenges taken-for-granted ways of thinking, and puts forward alternatives'; the interpretative theory is 'well recognized in related disciplines as a form of knowledge [...] helps us better understand a situation.' In other words, this current study examines the roles of drawing techniques and the problems in Korean landscape design education through literature review (interpretative function), thereby presenting alternative design education (critical function), and conducting empirical observation of the new class (instrumental function).

Theoretical perspectives

Scientific instrumentality and artistic imagination

Scholars of landscape architecture have described the significant dual roles of landscape visualisation during the design process – *scientific instrumentality* and *artistic imagination* (Corner, 1999; M.-J. Lee, 2017a, 2021b; Weller, 2014). *Scientific instrumentality* refers to the role of scientific ability in accurately visualising the appearance of a landscape, exemplified through conventional projections (including plan drafting, sections, and elevation). In contrast, *artistic imagination* refers to an expressive capacity to generate imaginative design ideas, embodied in loose perspective representations and diagrams. These two aspects of landscape visualisation also indicate the professional identity of landscape architecture, which has always been considered as a mutually complementary combination of art and science (Meyer, 2000) during the design process.

Korean landscape design education

In Korean landscape drawing education, however, the instrumentality of science has predominated over artistic ability. Korean landscape architecture educators have generally used

landscape-drawing techniques to imitate the appearance of landscapes (a *result* of design) rather than to develop and assess its performance (the *process* of design). Specifically, drawing classes have tended to comprise drafting training, similar to Beaux-Arts drawings, using conventional projections that include plan drafting, sections, elevations, details of coniferous and deciduous trees, as well as limited landscaping points of perspective (S.-H. Kim et al., 2003; Pae, 2016; Sin & Lee, 2000). The conventional, arduous, and rigid academic training in drawing has raised concerns around dissatisfaction among first-year landscape architecture university students, who have generally completed training in the natural sciences rather than art in high school, reinforcing the impression that landscape architecture is not a discipline involving the design and planning of actual landscapes, but a field of landscape drawing and representation (A.-Y. Kim, 2009, 2010). Specifically, students with poor drawing technique tend to lose interest in landscape design in the course, and give up landscape design studio (A.-Y. Kim, 2009, p. 188). Therefore, an alternative educational approach to basic-level hand-drawing and design studios needs to be developed to enhance students' awareness of the professional identity of landscape architecture, which includes the two fundamental roles of landscape drawing – *instrumentality* and *imagination*.

Collage and model-making in landscape design education

Landscape architecture is usually considered as a design activity that highlights the ground plane from the top view and vertical identities from the front view. A building is raised volumetrically with floors, walls, and roof, whereas designing a landscape is similar to positioning various types of plants and constructing their frontal appearance (Corner, 1992, pp. 253, 255; De Jong, 2008, p. 22; Mertens, 2010, pp. 10–11; M.-J. Lee, 2017b). The identity of landscape design is exemplified in the planometric approach, as a composite view of both the elevation of architecture, trees, and other plants and the map-like plan of the landscape. Accordingly, landscape designers facilitate the planometric perspective in using collage techniques, which as an unconventional representation, can juxtapose various landscape components from various perspectives using different materials. As such, in the 1980–1990s, landscape designers actively used manual collages to represent unconventional pastoral scenes while conceiving alternative landscapes and dynamic ecologies suitable for changing urban- and cityscapes (Brunier, 1996; Freytag, 2014; Geuze, 2000; M.-J. Lee & Pae, 2018).

When using the collage technique, however, it remains difficult to embody the actual qualitative experience of the landscape because a two-dimensional visual illustration has inherent limitations in representing three-dimensional tactile landscapes in terms of medium-specificity (Corner, 1992, 1999). Thus, landscape model-making can be an effective pedagogical tool for basic-level landscape design, as both the landscape and its model are three-dimensional media (Hou, 2012).

Large scale models maximise the ability to look over topographic conditions of the site, whereas small-scale models are effective in explicitly illustrating the finer details. When the scale of the site model is closer to that of the site, it better resembles the actual construction of the landscape (M.-J. Lee, 2021b). Furthermore, in landscape design education, and for basic design in particular, model-making can stimulate students to 'develop a tactile understanding of space, forms, and processes, an important foundation for a rigorous and more nuanced exploration of landscape representation and design' (Hou, 2012, p. 244).

Korean landscape design education processes have tended to be initiated from design ideation using diagrams, before depicting design results using two-dimensional drafting, collages, and model-making. A previous study indicated that students in landscape design studios of Korean universities faced difficulties, especially during creation of design theme and ideation, and specific detailed design (A.-Y. Kim, 2010, p. 20). In particular, the students had difficulty



Figure 1. Site aerial view (*source: author's drawing based on a digital map from the National Geographic Information Institute of Korea*).

developing their abstract design concept and idea into specific spatial and formative design (A.-Y. Kim, 2010, p. 23). To solve these problems and fulfil the fundamental and generative potential of collage and model-making, I developed an alternative novel design studio.

Design studio setting: reversing the design process

To facilitate hand-drawing techniques – not as instruments for the depiction of design results but as creative tools for the generation of design concepts – I changed the conventional order of the design process for the class under investigation. Specifically, instead of drafting projections utilising plan drafting, sections, and elevations, followed by collage- and model-making, it was more inspiring for first-year students to follow the reverse order whereby design ideation and development using collage and model-making precede plan drafting. I predicted that using this alternative approach would motivate students to break the rigidity of two-dimensional master plans, thereby flexibly deploying design ideas on a three-dimensional plane.

This design studio operated within the Department of Landscape Architecture at Gachon University in Korea during the fall term of 2018. Gachon University is one of two private four-year colleges within the capital area that offer a major in landscape architecture. It was a basic-level landscape design studio using various hand-drawing methods for 38 first-year students who were majoring in landscape architecture. In the spring semester of 2018, first-year students first experienced the conventional design process, and in the fall, they experienced design following an alternative educational methodology. The design site – the university campus – was familiar to students (see Figures 1 and 2).

Teacher's roles

In facilitating the alternative class, my role was four-fold. First, considering existing problems and opportunities for drawing techniques – including montage and collage – through a literature review, I organised this design studio to stimulate the students' attention and creative design thinking. Second, I actively advised the students on how to generate creative design thinking



Figure 2. Site photograph (source: author's photograph).

using collage and montage and conducted a short discussion of their challenges and positive acquisitions during the new design class. Third, I helped the students in the actual collage and model-making during the entire design process. Fourth, as an observer, I filmed the students' model-making process and finalised products three times, subsequently sharing the films with students of the class on YouTube (see <https://www.youtube.com/watch?v=Jb1FoO5fub8&t=40s>, <https://www.youtube.com/watch?v=W0LaPQWwpp4>, <https://www.youtube.com/watch?v=MJW3AyP82nE>).

Understanding the site

First, students fully understood the site and its surrounding context, thereby identifying several issues and design problems. For first-year students, the school campus was an everyday place, where various types of problems persisted, although the site was small in scale. In this process, I provided aerial photography and base plans produced by AutoCAD for students and an overview of the site conditions. Students conducted a site visit during which, photographs and videos were captured using mobile phones, to record the location information of the visuals. Back in the classroom, they spent time discussing the issues and problems with their team members.

Collage as a design ideation tool

The students produced collage drawings for design ideations to solve the problems. First, students quickly drew a zoning diagram on the base site plan, in which they roughly illustrated desired areas, circulations, entrances, and plantings. They then deployed creative design visions

using collage techniques. During this stage, they collected natural, artificial, and recycled materials for collage making. Understanding the materials and textures helped students to conceive the specific phenomenological mood of the design vision. Moreover, when the collage was created alone, it served as a significant communication medium with other team members.

Landform study through model-making

Students proceeded to represent their design idea in three dimensions using physical models to creatively study landform alternatives and effectively utilise appropriate ground materials. Two different scales were used: students first constructed preliminary models on the scale of 1:50 to understand the concept of scale in landform making on a site with little context; next, they produced intuitive design models on the scale of 1:100 for their campus plaza design. Specifically, three-dimensional landscape models were made on the base site plan using A3 paper (297 × 420 mm). During this stage, I emphasised three main points. First, students fully explored the topography consisting of depressions and mounds using foam core boards and clay materials. Clay is particularly plastic, fluid, responsive, tactile, and changeable in terms of medium specificity, thereby allowing students to transform their models rapidly and repeatedly while concentrating on the appearance of pure landforms and sectional changes. Second, students used human figurines to fully comprehend the sense and volume of space and scale. They tended to accept the scale in landscape design as a complicated number, and thus, found it hard to understand the fundamental function as a proportional ratio to transform the actual landscape to a larger or smaller scale. As the figurines instil a sense of scale in two-dimensional drawings, in three-dimensional models, they can imbue the sense of scale to facilitate easier and more intuitive estimates of the scale of actual design sites against the architectural and landscape components within it. Thus, human figurines can serve as a pedagogical tool for the concept and function of scale. Third, when their landforms and structures were almost complete, I required the students to combine materiality with the site structure. In basic-level landscape design education, students were required to experientially imagine the mood of the landscape they designed and to find, collect, and apply appropriate materials from within their everyday surroundings. Thus, students imagined natural changes in the site over time and chose one moment that they embodied in their physical models. They were required to look for, collect, and recycle natural and artificial materials around them rather than purchase products. The tactile manipulation of materiality within three-dimensional constructions provided opportunities for students to experience the multi-sensory qualities of the actual landscape.

Drafting and sharing

Finally, students produced hand drafts of the appearance of their finalised models. I asked the students to take pictures of their physical models directly from above – an orthogonal plan view. The students then printed the pictures onto A3 paper, from which they could trace this onto another piece of A3 paper. This process facilitated student's immediate and real understanding of plan drawing as a convention that represents three-dimensional landscape on the two-dimensional plane for effective communication with others.

I captured the continuous process of collage and model-making using photographs and videos, shared in real-time using an online platform. Moreover, I uploaded the students' partial and completed works onto the website, thereby encouraging the students to review their peers critically (see <https://earsjune2.wixsite.com/landscapedesign1>). These sharing processes were designed to motivate students to perform their works more efficiently by observing and communicating with other students.

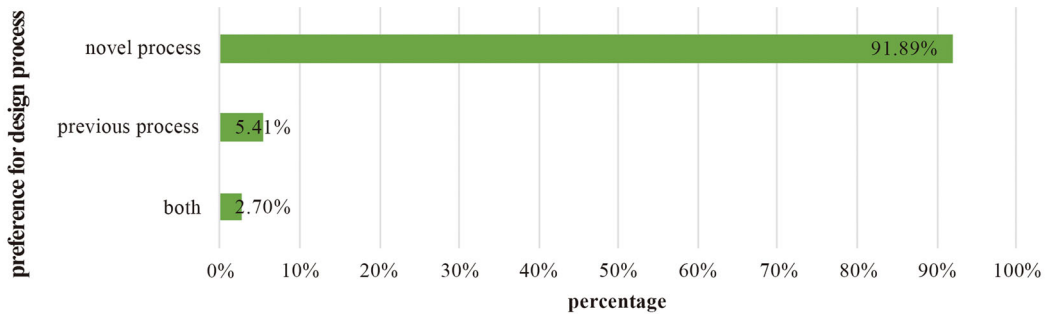


Figure 3. Students' preference for design process.

Questionnaire design

I administered a simple questionnaire to elicit the students' individual opinions. All the design processes were completed before the questionnaire surveys, which included open-ended questions, were distributed to the students. It was necessary to conduct this anonymous survey to collect the students' voices regarding the alternative design process, including positive and negative feedback, even though considerable conversation took place with all the students during the design process. The open-ended questions were intended to elicit honest and varied opinions, which were difficult to obtain via conversations during actual design studio process. Specifically, it included three main questions to understand which specific functions of collage and model-making were actively used by first-year students during the design process (see [Appendix A](#)).

Results and discussion

Collage and model-making for creative design development

This novel design studio process elicited positive responses from students. The first-year students majoring in landscape architecture were motivated by the flexibility in making collages and models – activities traditionally considered creative play. Moreover, this process elicited positive responses compared with the conventional process ([Figure 3](#)). The answers to open-ended questions showed several advantages of the alternative approach in terms of visualising the atmosphere of landscapes, development of design ideas, and developing a sense of scale and space. For example, one student – coded 19 – mentioned:

Personally, the alternative process of creating design ideas using collage and model-making made it easy to understand the site and develop my design idea [...] because the [collage and model making] enable me to imagine the mood of landscaping, thereby allowing me to absorb in the design process deeply.

Another respondent – coded 26 – asserted the advantage of the alternative design process as follows:

In my opinion, [in the conventional method] plan drawings precede [other types of drawings including collage and model making] and limit design ideas, whereas design ideation using montages [collages] was a creative method. Moreover, collage and model making enabled me to imagine [the] atmosphere of [a] landscape as well as communicate with other students and [the] teacher.

Furthermore, another student – coded 1 – mentioned that the alternative process 'enables me to understand the spatial sense of scale of the site, thereby designing three-dimensional landscape models [...] testing different scenarios of landforms.' Another student – coded 2 – stated that the new design process 'enabled me to envisage the [my design idea which was actualized] landscape after construction.'



Figure 4. Students' collage work for design ideation (created by Lee, Sang-Yeong).

Although I initially designed the alternative design studio considering desirable functions of collage and model-making derived from their medium-specificity, the students preferred the alternative process simply on the basis of the ease of its completion. In their words, the students described that in the new method of landscape design, it was 'easier to draw masterplans after model making' (students coded 21 and 22).

The disadvantages of the new process also emerged. A few students found that a drawback of the new design process was the time taken for the collage and model making. The respondent coded 19, who preferred the alternative process, stated that '[although there were advantages of the new design process], the pace of the new process was somewhat slow.' Similarly, another student coded 27 said, 'Although model-making helped me understand the spatial sense of scale, it took a long time to complete.' This is because they spent substantial time on elaboration by continuously estimating the size of the landscape while studying and modifying their landform, thereby designing their landscapes with a suitable sense of scale – something that first-year students generally find difficult to achieve. Additionally, another respondent – coded 37 – indicated, 'Whereas design through collage and model-making helped me improve three-dimensional understanding of the site, plan drawing offers an advantage in arranging the plants and structures.' Thus, future design education needs to include different drawing types and technologies to promote students' understanding of the significant roles of scientific instrumentality and artistic imagination in landscape representation.

Functions of collage

The students constructed collages to generate creative design ideas and conceive the phenomenological mood of the future landscape before engaging in a specific design. They collected



Figure 5. Students' collage work for design ideation (created by Kim, Seo-Yeon).

various landscape elements – including natural, artificial, and recycled materials – that represented the multifaceted observations of their landscape design idea.

The answers to open-ended questions on the collage technique indicated that most students recognised the collage technique's beneficial effects during the landscape design process in terms of design ideation, and imagination of landscape atmosphere. One respondent – coded 6 – indicated: 'I think the collage drawing enabled me to envisage specific moods of landscape that I want to design [...] because the collage was completed using various materials, which helped me simulate materiality of actual landscape.' Another student – code 22 – stated, 'I created and expanded my design idea through montage [collage], which also functioned as a good method for communication with others.' The student coded 24 indicated that the collage technique 'made the theme of space clear and enabled me to stimulate creative design ideation.' However, a few respondents raised drawbacks of the collage method. For example, one student coded 3 stated, 'Collage was not beneficial because it was done before specific design activities with a sense of scale.'

The students' collages were broadly divided into two types. First, they tended to compose a collage using a familiar perspective drawing type applied to landscape painting and photography (Figures 4 and 5). They tried to generate a depth of space on a two-dimensional picture plane, although without applying orthodox perspective techniques. In the collage in Figure 4, for example, various torn fragments of photographs and toothpicks with coloured pencils were used to represent a landscape scene by visualising a pond filled with yellow flowers and a lawn with white flowers on either side. A loosely applied one-point perspective conveyed a sense of depth on the picture plane, across which timber-deck promenades were placed. Components of human figurines walking the promenade were placed in the foreground to vitalise the collaged landscape.



Figure 6. Students' collage work for design ideation (created by Kim, Bo-Mi).

Second, I frequently observed planometric techniques in the students' work (Figures 6 and 7). Specifically, some attempted to hybridise two viewpoints in their collages by juxtaposing an eye-level elevation with a map-like plan of the future plaza. For example, the image in Figure 6 consists of a plan view of several roughly divided zones of the plaza with elevated facilities. Additionally, as in Figure 7, a multiplicity (that observes an object from multiple viewpoints) embodied in Cubist representations, was applied to students' work (M.-J. Lee, 2019, 2021b). These ways of visualising are generally considered inadequate and thus invalid techniques under the landscape drawing system. However, these explorations provided opportunities to discover how first-year students – who were not yet schooled in drawing conventions – understand landscape design activities (M.-J. Lee, 2019, 2021b).

Functions of model-making

Model-making fulfilled the essential function of materialising students' design ideas into a small-scale real space. Study models were effective pedagogical tools that assisted students in understanding that landscape design is an activity within a three-dimensional space and not a two-dimensional collage. The answers to open-ended questions on the model-making elicited positive responses from students, and indicated a preference for model-making over collage, specifically due to the opportunities it provided to understand the spatial sense of scale, generate design ideas, and study landforms. For example, the student coded 2 answered, 'Model-making gave me a sense of achievement due to the final product; it helped me imagine actual space in a way that allowed me to understand the scale and size of the space.' Another respondent – coded 14 – stated, 'Model-making helped me create design ideas that I could imagine alone in a way that it functioned as a communication tool with another team member.' Furthermore,



Figure 7. Students' collage work for design ideation (created by Jeong, Ji-ae).

model-making helped students to study landforms. For example, another student coded 16 indicated that the model-making 'provided opportunities for selection of materiality to help landform design.' A student – coded 19 – answered: 'Model-making helped me think whether my design idea is suitable [to the site] or not by producing a miniature for the landscape that I imagined. Moreover, the landscape model was easy to understand for me because it had a three-dimensional form, which leads to effective composition of landscape elements within the site.'

Human figurines assisted in suggesting a sense of scale that students directly associated with, thereby intuitively estimating the size of landscape components. For example, figurines ascended and descended models of stairs to roughly identify their width and height. Furthermore, students accurately compared chairs that they sat on with benches of the study model where figurines would be situated, thereby roughly estimating the applicable size of the campus plaza benches (Figures 8–10). Thus, by viewing the landscape models on a human scale, students exercised an appropriate sense of scale and displayed an understanding of the relationship between their physical models and the actual features.

The material study was also a powerfully effective educational tool. I encouraged the students to collect and recycle various natural materials in and around campus. The students used a range of different materials, including twigs, withered leaves, gravel, and even moss-covered soils, to explore the material qualities of the landscape elements (Figures 10–14). Moreover, students carefully considered the timeframe for the representation of landscapes – whose appearance varies at different times, including seasonal and daily changes – were fully explored. Some models, for example, incorporated different coloured ground leaves, rendered to convey the atmosphere of fall (Figure 11). One work created a moody winter scene of the future plaza by reusing bare dead twigs, which were wound with twine to protect them from frost damage (Figure 10).



Figure 8. Students' landscape model (created by Kim, Da-Eun and Son, Jae-Seok).



Figure 9. Students' landscape model (created by Oh, Ji-Woo and Kim, Seung-Taek).



Figure 10. Students' landscape model (created by Lee, Sang-Yeong and Kim, Jae-Heon).



Figure 11. Students' landscape model (created by Kim, Da-Eun and Son, Jae-Seok).

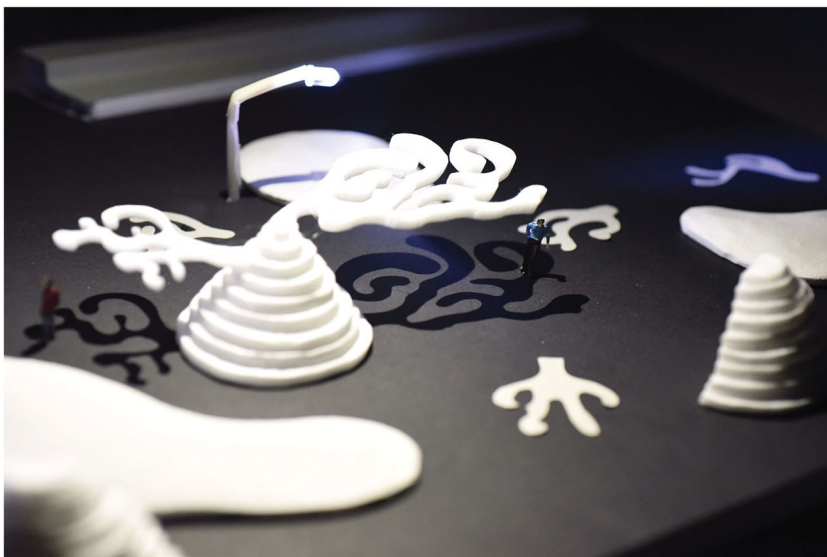


Figure 12. Students' landscape model (created by Kim, Jae-Yeon).



Figure 13. Students' landscape model (created by Jo, Su-Bin and Jeon, So-Hui).

Nightscales were often created for models and collages instead of the more common daytime landscape representations. One work attempted to redesign the campus plaza night lighting (Figure 12). It simulated the shadow movement of the designed lighting, whose appearance was intended to be seen like a plaza pavement. Moreover, some students transplanted green moss



Figure 14. Students' landscape model (created by Moon, Yeon-Du and Kim, Seo-Yeon).

or piled dirt on their landscape model (Figure 13) and then commented in the class that the model 'was filled with a smell like actual nature and the surface of the moss was soft.' Thus, intensive material studies of model-making were implemented to provide students with opportunities to experience their designed landscape from various sensory aspects, including olfactory and tactile senses.

Another important observation was the students' successful attempts at visible landscape design. The discourse on visible landscape design has been significantly addressed by scholars and designers of landscape architecture since the late nineties. Specifically, landscape design works have been criticised as lacking optical and cognitive aspects since landscape design has been assigned a passive and peripheral role in ornamenting architectural works (M.-J. Lee, 2020; Walker & Simo, 1994). In this alternative design class, students faced pressure to design surface shapes of the plaza including the pavement pattern, as well as the topography of mounds and depressions, using three-dimensional models (Figures 12–17). Modelling clay used to create landforms provided opportunities to repeatedly modify and apply smooth finishes to the topographical surface of the site, thereby creating the volumetric sculptural surface quality of the plaza. Furthermore, I asked the students to design and make landscape elements, including seating and lighting, instead of readymade modelling elements, allowing them to create imaginative and visually distinguished landscapes.

One of the reasons why the current generation of students preferred landscape model-making was that the modelling activity process was in some respects like a video game. Specifically, landscape modelling consists of making topography and situating landscape components on it. Similarly, various simulation video games – including the *Sims* series and *Planet Coaster* – enable users to generate a virtual topography, situated landscape, and other optional components (M.-J. Lee, 2021b). Most recently, real-time renderers built on video game engines – including



Figure 15. Students' landscape model (created by Choe, Ha-Eun).

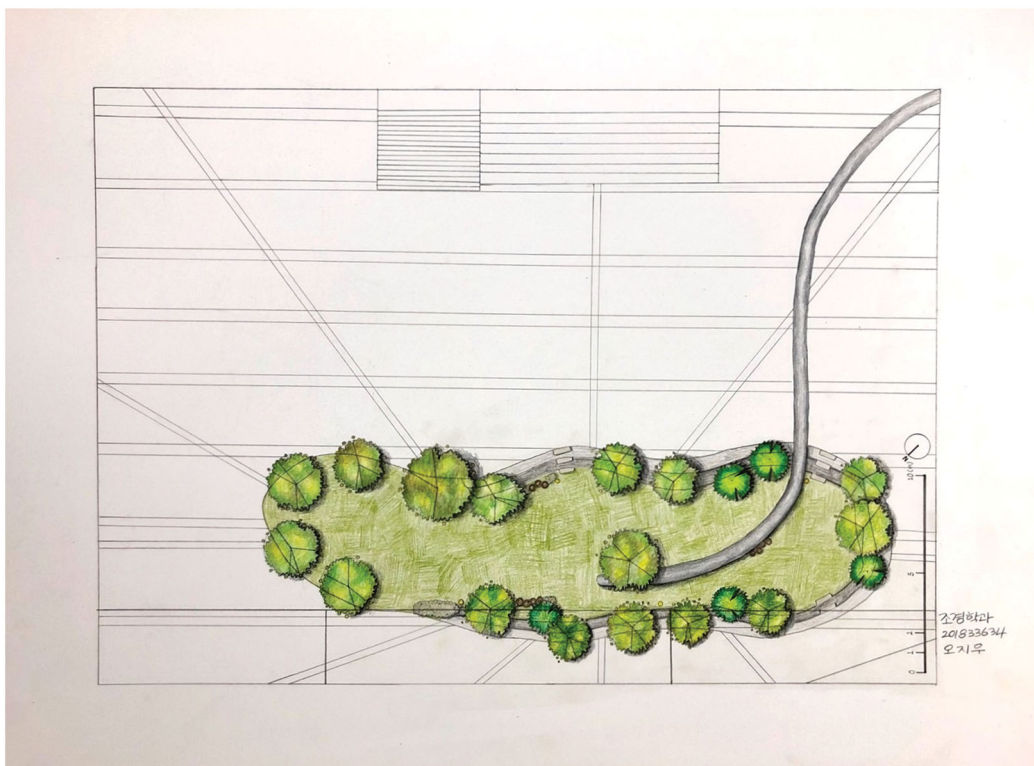


Figure 16. Plan drawing from physical model (created by Oh, Ji-Woo).

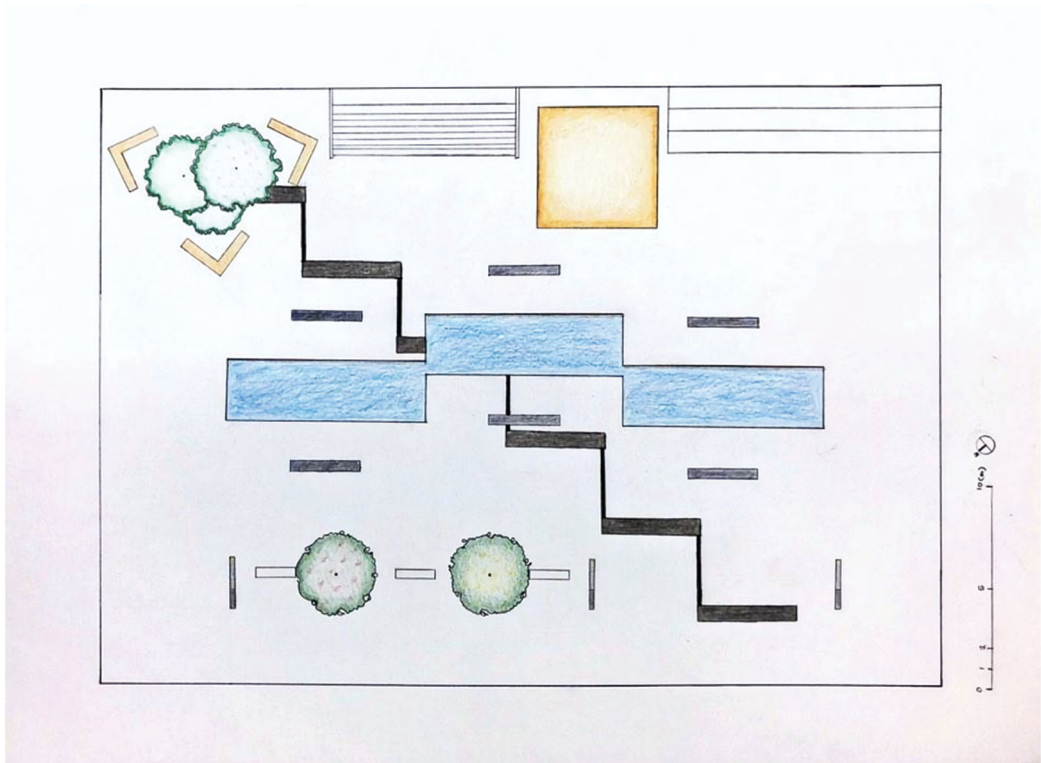


Figure 17. Plan drawing from physical model (created by Kim, Da-Eun).

Twinmotion and Lumion – are being enthusiastically embraced by landscape designers for landscape representation. Landscape models enable the easy and accurate simulation of landscape features whereby students can freely rotate the miniaturised landscape design from various viewpoints including planning, elevation, and perspective. Landscape model-making thus exemplifies the planometric vision of landscape design.

Conclusion

As this study demonstrated, collage and model-making can be used for creative ideation and its development during the overall design process. However, Korean basic-level landscape design studios have tended not to effectively use the creative potentials of the drawing techniques, as they have been used to merely imitate the result of a design than the process of design. The Korean basic-level landscape design classes have consisted of conventional and arduous drafting training, raising concerns around the dissatisfaction of first-year landscape architecture university students. To solve the problems and fulfil the generative potential of collage and model-making, I developed an alternative design studio, in which collage and model-making were used as effective pedagogical tools for an entry-level landscape design education. Specifically, the alternative design studio reversed conventional design process to stimulate students' creative design ideation and development by motivating them to actively use model-making and drawing techniques including collage, not merely to depict the results of design but as creative and generative tools for design ideation and development. They were effective techniques for first-year students – who had not yet been educated about professional landscape design – to fully understand the spatial sense of scale, creative design ideation, landform study, and texture and

material application. Participants considered collage as a creative technique for design ideation and imagination of the environment, while landscape modelling was an effective medium to foster a spatial sense of scale, design ideation, and the generation of flexible and sometimes undulating landforms. These findings indicate that landscape architecture educators could motivate first-year students' creative thinking using desirable functions of various hand-drawing types.

Moreover, I observed theoretically significant findings from the students' drawings. Collages revealed students' desire to simultaneously visualise the planning and elevational identities as a planometric perspective. Model-making, which was preferred over collage, provided opportunities for students to equate themselves with human figurines to understand the relationship between a spatial sense of scale and the actual features. Furthermore, the application of textures and materials on study models stimulated students to fully understand that a landscape medium has manifold sensory characteristics including visual, olfactory, and tactile. Additionally, students' works demonstrated the most recent re-emergence of form-generated visible landscape design explorations, which created the distinctive identity of a designed landscape.

Several limitations were evident. Although the students successfully conducted collage and model-making, this was only possible with prior knowledge of conventional drawing approaches, including plan drawings, elevations, and perspective. Planometric techniques observed in the collage work were alternative ways of visualising a landscape by hybridising these various drawing types. Moreover, some students tried to use two-dimensional plan drawings when making three-dimensional models, to roughly separate different zones and create paving patterns. Thus, future research should fully explore alternative educational strategies that facilitate various drawing techniques including drawing types and approaches to collage and model-making. Specifically, considering the varied functions and roles of two-dimensional drafting, three-dimensional models, and digital drawings, hybrid drawing techniques need further exploration as alternative pedagogical tools for motivating students' creative ideation and understanding of spatial sense of landscape. Additionally, since this study addressed only one educational program in Korea, it cannot be generalised to the whole of Korean landscape design education. Although this study addressed a particular Korean context, the findings rediscover the pedagogical values of hand-drawing techniques in the international landscape educational community. Collage and model-making can stimulate students to understand materiality and the spatial sense of scale and develop creative design processes, thereby providing opportunities to function as powerful pedagogical tools for international basic-level landscape design education. Since higher education systems and curricula related to landscape architecture vary across different cultures, further pedagogical approaches considering the different conditions need to be developed. Thus, this study can contribute to the international landscape design education literature by adding a case study of the understudied Korean landscape design pedagogy.

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Appendix A

Main questions of the student survey

I. You took two design classes applying different processes during the last two terms.

A: Understanding of site with bubble diagram -> plan drawing -> perspective drawing and collage drawing

B: Understanding of site with bubble diagram -> collage drawing -> model-making -> plan drawing

1. Which do you think is the more effective process of landscape design?

1) A. Give detailed reasons.

2) B. Answer below question No. 2.

3) Each has its pros and cons. Give detail.

II. List specific drawing types that benefitted or assisted your design, from among a plan/elevation and section/perspective, collage, and modeling, and then provide specific reasons.

III. Suggest a/another drawing method/s needed for the landscape design process, although you did not use it/them in this class.