

FREEHAND DRAWING FOR UNDERSTANDING AND IMAGINING URBAN SPACE IN DESIGN EDUCATION

Tomasz BRADECKI ^a, Michał STANGEL ^b

^a Dr.; Faculty of Architecture, The Silesian University of Technology, ul. Akademicka 7, 44-100 Gliwice, Poland
E-mail address: tomasz.bradecki@polsl.pl

^b Dr.; Faculty of Architecture, The Silesian University of Technology, ul. Akademicka 7, 44-100 Gliwice, Poland
E-mail address: michal.stangel@polsl.pl

Received: 7.02.2014; Revised: 21.03.2014; Accepted: 30.05.2014

Abstract

Architects and urban designers use freehand drawings as an important mean for observing, understanding, and envisioning urban space. Despite advancements in computer techniques, freehand drawing remains a quick, efficient and handy tool for urban design. Drawing the city is a broad subject, which covers several aspects of urban design: from analyses of the urban structure and morphology of urban spaces, visualizing ideas through diagrams and schematics, to producing artist impressions of the desired look and feeling of the designed spaces. Elements of freehand drawing, when adequately used together with photography and computer techniques, can produce meaningful representation of urban regeneration strategies, in paired images showing specific places “before and after”. While computer generated visualizations have become a commonly used, standard way of representing architectural and urban design projects, they are often too defined and too explicit. Freehand drawing on the other hand has the advantage of being less defined, more ideogramatic and impressionist, which gives the designer more flexible means for exploring various design aspects and possibilities. This paper presents experiences in urban design drawing from authors own design and academic experiences, with a particular focus on recent experiences from working as tutors in an international and multicultural environment within the intensive summer program “Let’s Exchange HERitage of Our CULTure – Drawing as Communication Tool of Students of architecture/engineers from European UniversitiES – HERCULES”.

Streszczenie

Architekci i urbaniści używają rysunku odręcznego jako narzędzia obserwacji, analizy i ukazywania możliwości kształtowania przestrzeni miejskiej. Pomimo rozwoju technik komputerowych, rysunek odręczny pozostaje szybkim, wydajnym i dogodnym narzędziem projektowym. Rysowanie miasta to szeroki temat, obejmujący szerokie spektrum zagadnień, takich jak analiza struktury i morfologii przestrzeni miejskich, wizualizacja idei za pomocą schematów i diagramów, tworzenie artystycznych wyobrażeń (wizualizacji) pożądanego wyglądu i atmosfery projektowanego miejsca. Elementy rysunku odręcznego umiejętnie połączone z analizą fotograficzną i technikami komputerowymi mogą stanowić poręczne narzędzie w procesach rewitalizacji przestrzeni miejskiej, m.in. poprzez zestawienia fotografii istniejących miejsc z rysunkami z nanieśionymi, pożądanymi zmianami. Choć wizualizacje komputerowe upowszechniły się jako standardowa forma prezentacji projektów, są one nieraz zbyt dosłowne i jednoznaczne, czy wręcz siermiężne. Natomiast rysunek odręczny, jako bardziej niejednoznaczny i impresyjny, daje projektantowi bardziej elastyczny środek wyrazu, który pozwala na poszukiwanie różnych możliwości projektowych. W artykule zaprezentowane zostały autorskie doświadczenia z użycia rysunku odręcznego w procesach projektowania urbanistycznego i z zajęć edukacyjnych. W szczególności opisano doświadczenia z pracy jako tutorzy w międzynarodowym i wielokulturowym środowisku podczas intensywnego kursu letniego HERCULES, organizowanego pod hasłem „Wymieńmy się naszym dziedzictwem kulturowym – rysunek odręczny jako środek komunikacji studentów architektury/budownictwa z uczelni europejskich”.

Keywords: Urban design; Sustainable urbanism; Freehand drawing; Diagram; Mastepplan; Sketch.

1. INTRODUCTION

Architects and urban designers have used drawings as an important part in the process of thinking about urban space, both as the physical fabric of the city, and the intellectual constructions that revolve around it. Drawing the city is a broad subject, which covers several aspects of urban design: from analyses of the urban structure and morphology of urban spaces, visualizing ideas, through diagrams and schematics, to producing artist impressions of the desired look and feel of places. As *Lorraine Farrelly* notes, *Drawing is a frame of the imagination, encouraging the gaze to move beyond the frame of the visible to the invisible, the probable to the improbable. She observes, that Architectural drawing is largely about the art of suggestion. Drawings will not explore every scale or aspect of the idea, but they will provide enough information to allow a glimpse into the possibilities for a scheme* [5].

Despite the development of digital techniques for architectural imaging, freehand drawing remains a very effective design tool. *Adam Gil* [7] compared the advantages of a sketch, physical model and digital model for various stages of creative work of an architect. He observed, that while computer generated visualization proliferate to be a standard way of representing architectural and urban design projects, they are often too defined and too explicit, especially for the early phases of the design process. A freehand drawing on the other hand has the advantage of being less defined, ideogrammatic and impressional, which allows to concentrate on the substance of the drawing, without being distracted by too many details.

Also type of drawing is important: depending on person who is drawing different approach may be expressed with different level of details. The same space may be different for a structural engineer, an architect and landscape architect (see Figure 1). These differences are the result of education and point of view for different profession.

2. THEORETICAL FRAMEWORK

Among several aspects of urban design one of its main goals is understanding, analyzing and envisioning the development of urban spaces. This include working and thinking about the city in various scales: from the functional and spatial structure of urbanized areas, through urban tissue of a district or neighborhood, to and urban block, public space and details of landscaping. Various drawings can show several aspects of urban spaces, such as physical dimensions, connectivity, functions, detailing, elements of infrastructure, etc. Despite advancements in computer techniques, freehand drawing remains a quick, efficient and handy tool for urban design. It allows to easily include elements of commentary on the drawing, to emphasize the most important elements of analysis or concept.

Drawing for visualizing urbanism ideas

Several influential ideas with a significant impact of the structure of cities were expressed through diagrams – *simple visual statements that distill particular values, ideologies and policy agendas*. Several of those drawings became milestones in urban design and planning, and as iconic images have inspired imitation, elaboration, reflection and criticism [8]. One of such examples is the idea of the “neighborhood unit” proposed by *Clarence Perry* in 1929, adapted and further elaborated by the movement of New Urbanism (*Elizabeth Plater-Zyberk, Andreas Duany, Peter Calthorpe*, and others), and further developed into the Sustainable Unit diagram by *Douglass Farr* [4].

Personal sketches constitute an important element of classic urban design treatises which became milestones in urban design theory, such as *The Image of the City* (Lynch, 1960), *Townscape* (Cullen, 1961), and the *Pattern Language* (Alexander, 1977). In Poland such an important, illustrated basis of urban design



Figure 1.

The same perspective view drawn in different manner – each one refers to different professions point of view: a) civil engineer (image shows building structure, b) architect (image shows buildings structure, and also what it does for perception (the overhang makes a shadow, large windows reflect surrounding landscape, c) landscape architect (image shows how the building fits to the the landscape – its more outline (silhouette) than a building); illustration Tomasz Bradecki 2013



Figure 2.
The city as an egg; illustration by Cedric Price

principles was elaborated by *Kazimierz Wejchert* as the *Elements of Urban Composition* [18]. Drawings have been also used for capturing reflections about the city in cartoons and comic strips. A famous example of reducing complex urban discussions to a cartoon is Cedric Price's diagnosis of the development of urban structure from ancient times to modern times – "The city as an egg" (Figure 2).

Freehand drawings have been used to identify key elements of the urban structure. *Kevin Lynch* famously used quick sketches of unskilled people to identify his five elements of the city as edges, paths, districts, nodes, landmarks [12]. In the concept of "The Analogous City" ("La città Analoga") *Aldo Rossi* [16] wrote, that every parts of a city can be characterized by primary elements (such as main routes, natural elements, monuments and artifacts related to memory and identity) and residential areas characterized by their shape and typology. For example, in a quick sketch analysis of the academic campus in Gliwice based on Aldo Rossi's method, *Carlo Berizzi* distinguished university buildings and the main road leading to the center as primary elements, and the residential areas of student dormitories, forming lines perpendicular to the road [2].

The use of freehand artist impressions and master-plans is commonly used in urban design projects within the trend of rediscovery of traditional dense built form, expressed e.g. by the American movement of new urbanism (*Elizabeth Plater-Zyberk*, *Andreas Duany*, *Peter Calthorpe*, and others), *Rob Krier* or architects associated with the Prince of Wales Foundation for the Built Environment. The search for compact neighborhood solutions in projects such as Poundbury (Dorset, England) or Kirchsteigfeld (Potsdam, Germany) was often presented in a range of freehand drawing analyses, concept drawings, variants, etc. which helped in refining the concept. *Leon*

Krier in the book "The Architecture of Community" advocates for traditional urbanism and uses both sketches of urban spaces and cartoons to support his strong criticism of urban sprawl and modernist architecture [10].

Drawing for visualizing urban regeneration and placemaking

The notion of urban regeneration projects has inspired a growth and mixture of graphic techniques for communicating projects vision, which include several methods for producing hand-rendered or computer-generated visuals for the entire planning process, from community consultations to final reports [14].

Elements of freehand drawing, when adequately used together with photography and computer techniques, can produce meaningful representation of urban regeneration strategies, in paired images showing specific places "before and after" the suggested spatial improvements. These may include sanitation of building frontages, new functions in buildings, such as retail or dining, improvements in urban landscaping and furniture – plants, benches, lamps, signage, etc (see example Figure 3). Drawings can also show well the essence of vibrant urban spaces, which Jan Gehl famously called "life between buildings" [6] – people inhabiting urban spaces, and the mixture of their various activities – from running daily errands, to urban recreation and social activities.

Urban design drawing provide means to envision innovative ideas, which can provide additional value and quality of space, such as beauty, sense of place, pleasurable experiences, building local identity and pride, etc.

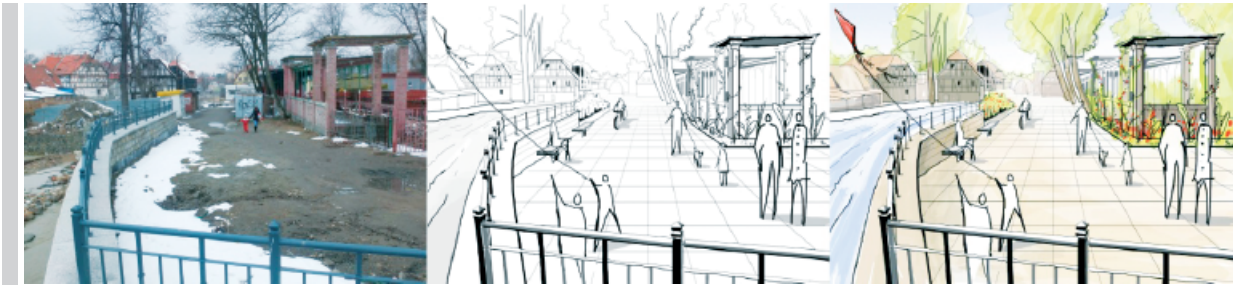


Figure 3. Before/after images using the technique of freehand drawing with graphic tablet – comparison (a) left: original site, (b) middle: initial freehand sketch based on the photography, (c) right: final sketch showing the urban intervention) – colors indicate greenery and surfaces, which demonstrate positive potential of the design illustration by M. Ulfik, 2013

Drawing for envisioning urban design concepts

The way the drawings are presented and showed together can be an important issue in formulating a convincing story and message, that an urban design concept aims at. In a comprehensive *visual compendium of types and methods* for architectural drawing *Rendow Yee* presents a sectional review of various aspects of architectural drawing and various ways in which a drawing and composition can enrich the project. In discussing the presentation formats, one of the case studies is Grangegorman Master Plan for a campus extension in the northern part of Dublin; a project by Moore Ruble Yudell Architects & Planners and DMOD Architects. The competition project was presented on six panels, organized to engage the viewers attention, and combining digital

images with drawings and watercolors, to “tell a comprehensive and convincing story”. The architects reflect, that this organizational strategy enhanced the masterplans presentation and helped their team win the competition [18].

A similar example from authors own experience can be drawn from the winning competition entry in the *Nowa Huta of the Future* international ideas competition for development of a programme and spatial vision of the east part of Kraków (a site of over 5000 hectares in the perspective of next 30 years). The proposed vision envisioned a compact urban structure, which would be in a way a contemporary reinterpretation of the dense city such as historic Kraków. The vision included a regeneration strategy for post-industrial areas, as well as a range of flagship pro-

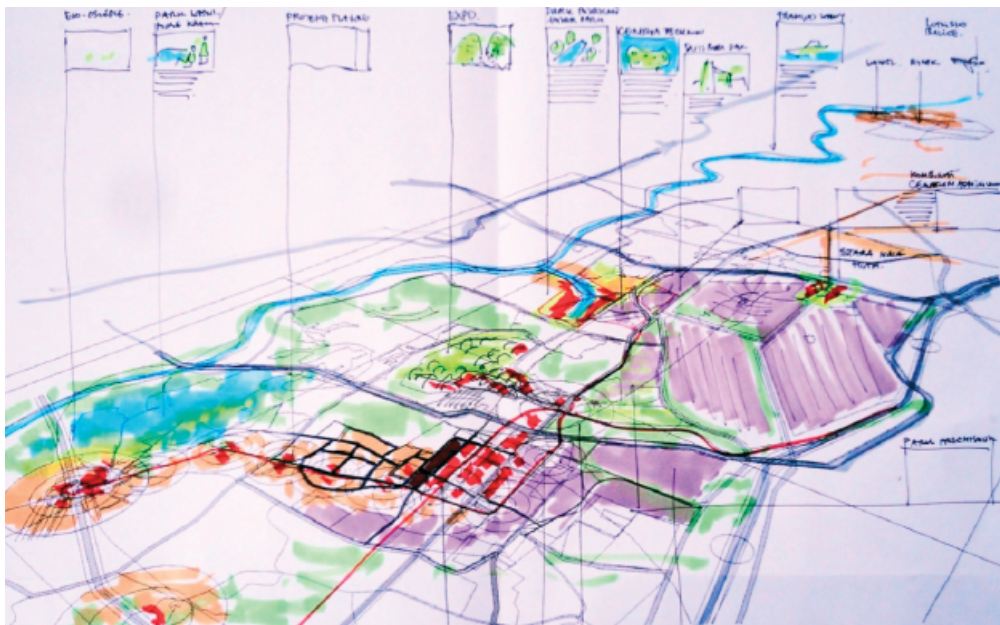


Figure 4. Freehand conceptual sketch for initial idea for competition in Nowa Huta (Stangel, 2012)

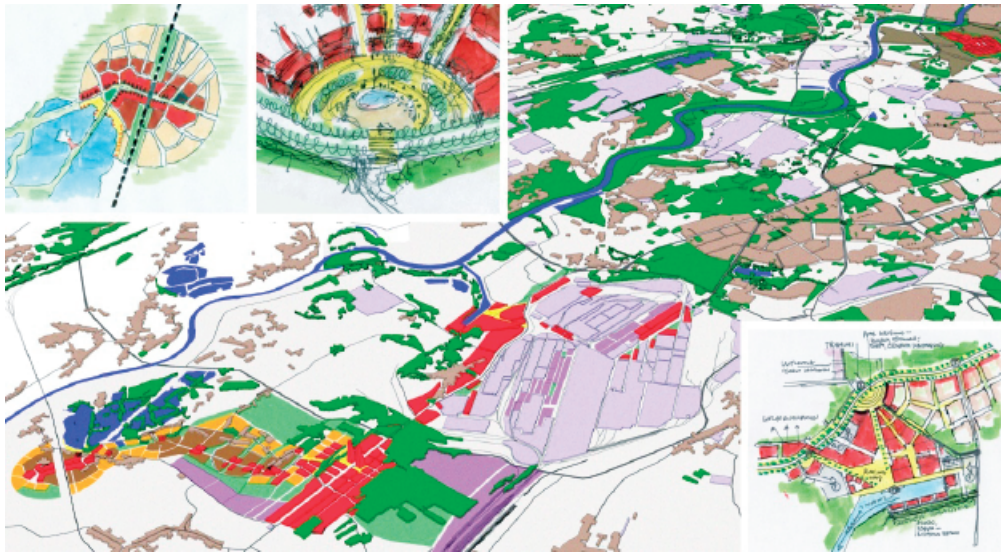


Figure 5. Detailed freehand drawing and precise 3d model (computer generated) – Nowa Huta of the Future competition design – visualization of the urban structure (A. Karłowska, A. Saucha, 2012) accompanied with freehand sketches (M. Stangel)

jects, which may constitute new investment offers and new recognizable attractions and landmarks.

Freehand drawing was extensively used in elaborating the competition project. The author made several attempts to the layout of the main visualization, combining various views at the computer model with freehand sketches (Figure 4) and explanations of the flagship projects. Finally, it allowed to draw such a view, which would show the whole competition area with relation to main components of the urban structure of Cracow, such as Vistula river and the historic centre with market square. The author's competition entry was the only one among the submitted projects which used such view and layout, which undoubtedly supported the clear and comprehensive communication of the vision. The three dimensional drawing elaborated as a sketch was further elaborated into a large scale computer generated image (Figure 5), accompanied by freehand sketches further explaining several ideas of the project.

3. METHODS FOR ANALYSING AND ENVISIONING URBAN SPACES BY STUDENTS IN AN INTENSIVE PROGRAMME

In summer 2013 the authors took part as tutors in the intensive programme HERCULES (*Let's Exchange HERitage of Our CULTure – Drawing as Communication Tool of Students of architecture/engineers from European*

UniversitiES). It was coordinated by prof. Piotr Obracaj and Opole University of Technology, and held in Gliwice and Opole. Participants represented both architecture and engineering faculties. Under those conditions (various drawing skills and approach) a unified drawing style was impossible to achieve since students groups were international from beginning of the course. Therefore authors decided not to focus on drawing skill but in general to test the ability of urban space perception.

The drawing sites were typical urban spaces (city centre, old town) and landscape (Pławniowice castle and park). Each student chose a view in a group as final posters consisted of all drawings from each group member. Some of the drawing did not need to be perspective sketches, but could be plans or sections, or even quasi structural (engineering) drawings.

The tasks were to analyze a site and produce a series of drawings: a plan, perspective views, cross sections, other views and the urban landscape after intended intervention. Most exercises took place in Gliwice. One field trip in Katowice showed its modern architecture in the centre, and the historic area of Nikiszowiec with its original urban layout and architecture from 30's. Most students were choosing similar subjects, and only the choice of details was different. The character of the place was well recognised. The last drawing experiment – “a postcard from Silesia” – tested memory and skill of composition even more than drawing skill. This kind of exercise also shows what seems to be the most important or most recognizable.

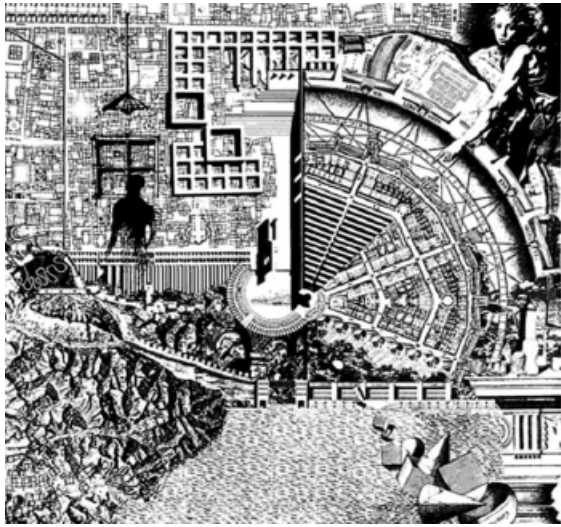


Figure 6.
Urban analysis by Aldo Rossi (A. Rossi, 1984)



Figure 7.
An example of urban analysis of the academic campus in Gliwice based on Aldo Rossi's method (C. Berizzi, 2013; aerial photo googlemaps)



Figure 8.
“Before” drawing – one of the sites next to railway station, Zwycięstwa street – low quality of urban landscape; illustration by students from Hercules programme

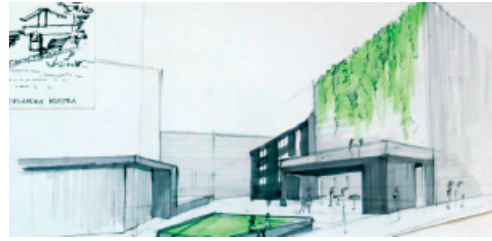


Figure 9.
“After” drawing – proposal for new kiosk and better quality of landscape; illustration by students from Hercules programme



Figure 10.
“Before” drawing – Piastów square – bus stop; illustration by students from Hercules programme



Figure 11.
“After” drawing – proposal for shelter for bus stop on Piastów square; illustration by students from Hercules programme

The outcomes were rated by 12 teachers from various universities. The rating for different tasks in Gliwice was different: there was no single team which would gather most of the points, what means that the choice of the tasks allowed for different abilities demonstration – not only drawing techniques, but also ideas within the drawing.

4. EVALUATION OF RESULTS AND DISCUSSION

Despite the fact that all the drawing have been done by amateurs, they can be presumed as intuitive and they show real comment on site (Table 1). In spite of the poor drawing skill several elements were highlighted by: drawing the things with thicker line or stronger (Figure 10, 11) or several times one line on another with hatching was more convincing than proper perspective drawings with standard thickness of the line (Figure 8, 9).



Figure 12.
Characteristic views from Nikiszowiec (heritage site area)



Figure 13.
Typical views from Pławniowice castle (views choice by students)



Figure 14.
Postcard from Silesia – most of the drawings chosen for the illustration were landmarks, only one presents heritage; illustration students from Hercules programme



Figure 15. Postcard from Silesia: one drawing presents landmark and one edge, the other show cultural heritage

Table 1. BEFORE AFTER urban design drawing task – comparison of amateurs and professionals potential (rating: – minus, +/- zero, +)

| | Amateurs | Professional |
|--|----------|--------------|
| Knowledge about the site | - | + |
| General Knowledge about urban design and urban development | - | + |
| Plan drawing | +/- | + |
| Section drawing | +/- | + |
| Detail drawing | + | + |
| Overall view drawing | + | +/- |
| After drawing | + | + |

The exercises showed that some urban elements were similar in different places (Figure 12, 13, 14, 15). Some of the drawings showed Lynch’s elements of the city: there were mostly landmarks or nodes (Figure 14, 15). Most of the drawings showed mostly buildings or their elements, very few showed fore-

ground or background (urban landscape) what we may consider as the fact, that people do think about specific objects, but do not math them to the landscape around. One drawing used a brick texture as a background, what expressed that the brick was seen many times and was recognized as an important building material characteristic for the location.

The brief for presentation drawing stated that structural drawings or drawing showing the proportions and structural elements should be included. Although students have prepared them, only a few have been finally presented during exhibition. Also drawings that used more outline than structure were more expressive. That shows that it is rather more important what architecture looks like, than how it is being constructed. We may forecast that the drawings performed as landscape architects do (example Figure 1c) may be better to show the urban layout than other.

Very few drawings included people although most of the sites were busy urban areas. The architectural

Table 2.**Statistics for presentation boards: average amount of presented drawings types which were part of the presentation**

| | Total views presented on board | Number of site plans per drawing | Drawings of landmarks /buildings | Urban landscape showed | Detail drawing | Structure diagram | People/urban life in the street |
|--|--------------------------------|----------------------------------|----------------------------------|------------------------|----------------|-------------------|---------------------------------|
| 1. "Before/after" urban interventions, Gliwice | 7-9 | 1-2 | 0-2 | 4-5 | 0 | 0 | 7 |
| 2. Urban landscape Katowice | 7-9 | 0 | 3-4 | 2-3 | 1-2 | 1 | 1 |
| 3. Urban landscape – Gliwice | 6-8 | 0 | 2-3 | 1-2 | 2-3 | 1 | 1 |
| 4. Park landscape – Pławniowice | 5-6 | 0 | - | - | 1-2 | 1 | 0 |
| 5. Postcard / synthesis | 5-6 | 1 | 5-6 | 1 | 0 | 0 | 0 |

drawing theory states that showing a human expresses the scale. The urban drawing theory states that human actions in the street show urban life, how the space is being used, and indicate type of use: e.g. person who holds a balloon or kite, and holds a kid's hand (see Figure 3c) indicates that urban space is pedestrian friendly or that a toyshop is nearby. The reason for that fact may be lack of human drawing skill, however, humans were drawn in first exercise which was strictly connected with urban lifestyle (see Table 2).

5. CONCLUSIONS

Freehand drawing remains important for observing, understanding, commenting and envisioning urban space. While drawing the city is a broad subject, thoroughly covered in the canons of urban design literature, it seems that students nowadays often tend to forget of the advantages of such a convenient tool, and choose to work with computer drawings and visualizations too quickly. Producing good computer images needs skills and is time consuming, and computer generated images of unskilled students on the preliminary stages of the design process are often too explicit, misleading, or simply dull and shallow. Freehand drawing on the other hand has the advantage of being less defined and more ideogramatic, which gives more flexibility in exploring various design aspects and possibilities.

The authors' experiences from the summer program assignments showed the possibilities of using freehand drawing for preliminary, subjective urban space analysis for both architecture and building engineering students, in an international group. The results of the program showed, that although some of the students didn't have any practice with freehand drawing, the overall level of presentations seemed satisfying. Freehand drawing encouraged communication and

team work for best final results. The assignments made students use their best skills: some of them were drawing perspectives, some of them analytic drawings etc. This team work resembles professional urban design methods, when architects, urban designers and landscape architects exchange their opinions and work together. In that case we may consider that both team work and variety of professional knowledge brought benefits to the program.

The results of the assignments revealed that some of the drawings would be better rated if additional comments were added as written text and discussed above the way. Drawing skill is not the most important aspect of urban analysis as long as we consider clear (easy to understand) analysis and clear demonstration of the idea (based on proper analysis). Drawing or diagrams are much more easy to understand when words, arrows or signs are added, even though they may appear to be too obvious.

A general conclusion is that freehand drawing remains an important tool for urban analysis and communication within the team, and drawing assignments give satisfactory results, and an interesting educational experience for students with various initial freehand drawing skills. Despite all the new possibilities of computer generated images, freehand drawing shall remain an important mean for understanding and imagining urban space in architectural design education.

ACKNOWLEDGEMENTS

This paper was written using the experiences and results of the intensive summer programme Let's Exchange HERitage of our CULTure – drawing as communication tool of students of architecture/engineers from European universities – HERCULES, supported by the European Union within Erasmus Lifelong Learning Programme for Intensive Programmes.

Participating universities: Opole University of Technology, Silesian University of Technology, VIA University College (Denmark), UPV Escuela Tecnica Superior de Ingenieria de Edificacion (Spain), Universitat Jaume I – Escuela Tecnica Superior de Tecnologia y Ciencias Experimentales (Spain), Hämeen ammattikorkeakoulu HAMK (Finland), Università degli Studi di Pavia (Italy).

Tutors: prof. Piotr Obracaj (programme coordinator), Andrea Salandin, Luis Palmero, Anna Szczegielniak, Beatriz Sáez Riquelme, Carlo Berizzi, Eric Toft, Juan Antonio García Esparza, Luigi Trentin, Michał Stangel, Ole Sand, Tomasz Bradecki.

Students: Adriá Cebrián Carla, Ferrer Madrid Elena, Garcia Lloris Maria, Yepes López Ana, Garcia Moratalla Irene, Valentina Bellotti, Francesca Scalzone, Giulia Bonezzi, Luca Alessio, Stefano Pastore, Ferran Escalada Beltrán, Alejandra Mañá Aguilar, José Pallares Marza, Coral Escorihuela Sales, Tünder Borbely, Thomas Gude Jensen, Nicolai Hørlykke, Mikkel Christian Hansen, Svend Gram Novrup, Dennis Snedikker Jacobsen, Gichuki Lilian Wamuyu, Laakkonen Wille Peter, Justyna Feliksik, Anna Gliszczynska, Aleksandra Kustra, Magdalena Milert, Ewa Piszczek, Tomasz Szuliński, Maciej Skrzypczyk, Emilia Szczudło, Mateusz Halek, Zofia Kasińska, Weronika Madura, Helena Jadasz, Ewa Stelmach, Barbara Lebich.

A film impression of the programme, edited by Justyna Feliksik is available at

<http://www.youtube.com/watch?v=rMZdWJdyoZA>.

REFERENCES

- [1] *Alexander C., et al.*; A Pattern Language Towns, Buildings, Construction. Oxford University Press, New York 1977
- [2] *Berizzi C.*; Lecture “Drawing for urban analysis and planning”, Gliwice, August 2013
- [3] *Cullen G.*; Townscape. Architectural Press, London 1961
- [4] *Farr D.*; Sustainable Urbanism – Urban Design with nature. River Street 2008
- [5] *Farrelly L.*; Drawing for Urban Design. Laurence King Publishers 2011
- [6] *Gehl J.*; Life Between Buildings: Using Public Space. Reinhold, New York 1987
- [7] *Gil A.*; Szkic, makieta, model komputerowy jako narzędzia pracy twórczej architekta. Rozprawa doktorska, Wydział Architektury Politechniki Śląskiej, 2005. (Sketch, mockup & computer model as tools of architect's creative work (doctoral thesis). Faculty of Architecture, Silesian University of Technology, Gliwice 2005
- [8] *Grant B.*; Grand Reductions: 10 Diagrams That Changed City Planning. The Urbanist Issue 518, November 2012
- [9] Intensive Program Let's Exchange HERitage of our CULTure – drawing as communication tool of students of architecture/engineers from European universities – HERCULES webpage – <http://architektura-hercules.po.opole.pl/>
- [10] *Krier L.*; The Architecture of Community. Island Press, Washington 2009
- [11] *Llewelyn-Davies*; Urban design compedium, English Partnerships, London 2003
- [12] *Lynch K.*; The Image of the City. MIT Press, Cambridge 1960
- [13] *Marshall S.*; Science, pseudo-science and urban design. Urban Design International (2012) 17, p.257-271
- [14] *Meeda B., Parkyn N., Walton D.*; Graphics for Urban Design. Thomas Telford 2007
- [15] Nowa Huta of the Future competition project – M. Stangel, A. Drobniak, M. Beim, A. Polko, R. Schurma, A. Karłowska, A. Saucha, M. Węzykowski
- [16] *Rossi A.*; The Architecture of the City. MIT Press, Cambridge 1984
- [17] *Weichert K.*; Elementy Kompozycji Urbanistycznej (Elements of Urban Composition). Arkady, Warszawa 1974
- [18] *Yee R.*; Architectural Drawing: A Visual Compendium of Types and Methods. Wiley 2012