UNIVERSITY OF LIVERPOOL

Volume I

Teaching Discipline Space: Experimental Architectural Pedagogy at VKhUTEMAS (1923–1926)–Moscow

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To my Mother and Father……… for all their patience and support

Abstract of Thesis

This thesis focusses on the pedagogical methods of the Russian Architecture School

VKhUTEMAS (*Vysshie gosudarstvennye khudozhestvenno tekhnicheskye masterskie* – Higher

State Artistic and Technical Studios 1921–1926) through a discipline of architectural teaching

known as Discipline Space (*Prostrastvennyi*). In particular, this thesis has two specific aims.

Firstly, to portray how Discipline Space is taught between 1923–1926 at VKhUTEMAS.

Secondly, to examine whether Nikolai Alexandrovich Ladovskii's (1881–1941) teaching of Space

(1921–1923), influenced how Discipline Space is taught. The thesis is underpinned by a

selection of 'terms' and 'concepts' to define Discipline Space and three areas of Ladovskii's

teaching, identified by the Soviet scholar Khan-Magomedov (1928-2011), namely: Process,

Sequence and Model-Format, to become used as a means to portray Discipline Space teaching.

To address these research aims, the thesis establishes a 'solid' archival approach, using

assignment drawings, system of visual materials, models, workshop and exhibition

photographs accessed through archives, institutions and private collections in Moscow,

Montreal, London, New York, Los Angeles, Berlin and Cambridge. The archival material

provides the primary entry into the thesis through a constructed repository (vol. II) used to

store all collected material. The repository is used to frame the period of teaching under

consideration, allowing the sourced material to be pieced together through a multi-

pedagogical analysis to portray the way in which Discipline Space came to be taught.

Acknowledgements

Several people have shaped the direction of this thesis. I would like to thank my supervisors,

Dr. Marco Iuliano and Dr. Christina Malathouni, who were supportive throughout the four

years of my research. Not being a native Russian and having very few contacts in Russia, I

found it difficult to view all the archives, institutions and private collections and, without their

assistance and appropriate permission, the research would have been considerably more

difficult. I would also like to thank the two members of the inter-library loan team as, while

little relevant literature is housed at the university for such meticulous and focussed research

on the topic of Soviet pedagogy, their assistance and the swift borrowing system in place at the

university made completion of this thesis possible.

Translations

As the author is British and required a significant amount of archival material for the research

to commence, the pedagogical focus of research imposed obvious limitations. Because of this, I

was obliged to acquire basic knowledge of Russian to pursue the research thoroughly. At the

beginning of the research the author attended a 10 Week Course (Russian, Beginner 1) in

Manchester allowing a basic understanding of reading to be achieved allowing for thorough

archival translation. The style of the assignment drawings, instruction and photograph

descriptions obtained through archival research has not been altered and is faithful to the

Soviet style format of expression. Throughout the thesis, reference to the chosen Russian

literature is made in the footnotes, confirming the translation that took place, e.g., 'Translation

by author, Russian original.' The same format is used where small amounts of French text have

been included. Past publications have sought to follow the British Library system of

transliteration with the likes of Khan-Magomedov, *Pioneers of Soviet Architecture*, translated

by Catherine Cooke; with all name endings of the type –yi, -ii, and rendered an –y. This style

has been chosen for use in this thesis, maintaining a clear translation of endings of the type –y,

-yi, and rendered an –ii. The vast majority of surnames are already known within the existing

context of VKhUTEMAS and Discipline Space. When they first appear, individuals are

mentioned with given name and surname. Thereafter, they are mentioned only by surname. It

should be noted that past scholars have referenced the names vkhutemas, Vkhutein and

(Inkhuk) in lower form; however, for the purpose of the research, each is spelt in upper case –

VKhUTEMAS, VKhUTEIN and (INKhUK). In reference to the work by Khan-Magomedov, the term

Space Discipline or Space *Konsentne* has been used by different scholars; however, the format

'Discipline Space' has been used throughout this thesis as it appears more readily in the work

of Khan-Magomedov. Throughout the thesis, the term pedagogy remains the primary word to

define the teaching of Discipline Space, however, at times to avoid repetition, the terms 'the

subject', 'teaching' and 'education' will be used.

List of Abbreviations

ASNOVA *Assotsiatsiia novykh arkhitektorov* (Association of New Architects)

CCA Canadian Center for Architecture

INKhUK *Institut khudozhestvennoi kul'tury* (Institute of Artistic Culture)

MAUR A. V. Shchusev (State Museum of Architecture)

NARKOMPROS *Narodnyi komissariat prosveshcheniia* (People's Commissariat of Enlightenment)

OBMAS *Ob'edinennye 'levye' masterskie* (United Leftist Studios)

SKhPU (Stroganov School of Industrial and Applied Art)

SINSKUL'PTARKH *Komissiia skul'pturno-arkhitekturnogo sinteza* (Commission for the Synthesis of Sculpture and Architecture)

RGALI (Russian State Archives of Literature and Art)

UZhVZ (the School of Painting, Sculpture and Architecture)

VKhUTEMAS *Vysshie gosudarstvennye khudozhestvenno tekhnicheskye masterskie* (Higher State Artistic and Technical Studios)

VKhUTEIN *Vysshi gosudarstvennyi khudozhestvenno-tekhnicheskii institut* (Higher State Artistic and Technical Institution)

ZHIVSKUL'PTARKH *Kollectiv zhivopisno-skulpturno-arkhitekturnogo sinteza* (Collective for the Synthesis of Painting, Sculpture and Architecture)

Chapter III
Archival Material (1923-1926)...77

Chapter IV

Case Studies, Analysis and Assessment

4.1 Introduction

4.2 General Introduction to Case Studies

4.3 Process, Sequence and Model-Format Analysis

    4.3.1 Stage 3–Discussion of Assignments

    4.3.2 Stage 4–Assignments Issued

    4.3.3 Stage 5–System of Visual Materials

    4.3.4 Stage 6–Workshop (Lecture Hall)

    4.3.5 Stage 8–Construct through Modelling

    4.3.6 Stage 9, 10, 11 and 12–Collective Discussions (ii), Collective Evaluation,

        Assimilate the Discipline and Development of Critical Skills

    4.3.7 Stage 16–Exhibition of Student Works

4.4 Discipline Space Assessment

    4.4.1 Process Assessment

    4.4.2 Sequence Assessment

    4.4.3 Model-Format Assessment

    4.4.4 Relationships between Stages of Teaching

    4.4.5 Students Learning of Space

    4.4.6 Discipline Space Teaching

4.5 Summary of Chapter

Chapter V

Discussion

4.1 Introduction

5.2 Ladovskii's Theory/Pedagogy and Discipline Space (1921-1923/1923-1926)

5.3 Process Discussion

5.4 Sequence Discussion

5.5 Model-Format Discussions

5.6 Teaching the Masses and the Impact on Space Learning

5.7 Space Theory in the context of Space Teaching and Learning

5.8 Use of the Model on Students Space Learning

5.9 The Impact of the Model on how Space is taught

5.10 The Outcome of Students Learning of Space

5.11 Summary of Chapter

Chapter VI

Conclusion………………………………………………….……………………………177

6.1 Findings of the Study
6.2 Significance and Contribution of Study
6.3 Applicability of the Conceptual [Framework] and Space Methodology Design
6.4 Wider Relevance and Future Research

Bibliography…………………………………………………………………………….…185

Archival Sources
References Primary
References Secondary
Image References

Appendices………………………………………………………………………….…200

Appendix I–Methodology
     Process Analysis (chapter 4)
     Sequence Analysis (chapter 4)
     Model-Format Analysis (chapter 4)
     Pedagogical Comparisons: Stages of teaching (chapter 4)
     Comparison of Pedagogical Findings (1921-1923/1923-1926) (chapter 5)
Appendix II–Methods
     Discipline Space Assessment Methods
     Process of Teaching as a [Framework] for Case Selection
     Criteria for Case Selection
     Soviet Translation and Document Analysis Method
     Photograph Analysis Method
     Space Photographs (Coding)
     Photograph Category Types: Workshop (Lecture Hall), Models, System of
     Visual Materials and Exhibition Photographs
     Code (Type A) Workshop (Lecture Hall) (stages 3, 6, 9–12)
     Code (Type B) Models (stage 8)
     Code (Type C) System of Visual Materials (stage 5)
     Code (Type D) Exhibition of Student Works (stage 16)
     Comparative Analysis Method
Appendix III–Terms and Concepts
Appendix IV–Assignment Drawings
Appendix V–Model Types
Appendix VI–System of Visual Materials, Workshop and Exhibitions

List of Figures and Tables

Chapter 4

Table. 4.1. Stages of Discipline Space pedagogy in comparison with selected case studies. The case studies have been chosen from a multitude of archives, institutions and private collections. Source: currently housed at Canadian Centre for Architecture (CCA), Moscow School of Architecture (MARKhI), Archive of A. V. Shchusev State Museum of Architecture Museum (MUAR), Kicken Gallery, Private Collection (I) (PC) (See pull-out II further full account). Table constructed by author

Figure. 4.2. Krinskii with students and Korzhev (left, in checked shirt) with Turkus (wearing tie) discussing assignments (Gelatin Silver Print) source: currently housed at the Archive of A. V. Shchusev State Museum of Architecture MUAR, Archive No: Unknown

Table. 4.3. The 7 assignment drawings analysis exposing instructions: conditions, questions, problem-solving tools, method of solution, model/drawing, scale and deadline. Table constructed by author

Figures. 4.4–4.6. Three assignment drawings by Lamtsov consisting of top: 'Form', bottom left: 'Space', and bottom right: 'Surface' each assignment drawing contained in different formats and levels of instructions (source: Khan-Magomedov, 2007, pp. 266–269)

Figures. 4.7–4.10. Four case study assignment drawings by Lamtsov, consisting of one assignment on 'Form' consisting of two parts and three assignments on 'Mass and Weight'. Each assignment depicts different pedagogical functions and formats based on the amount of instructions provided. Source: currently housed at Moscow School of Architecture Museum MARKhI Archive No: Top, Кп 501-29-30 – MARKhI. Middle: Кп 501-31 – MARKhI. Bottom Left: Кп 501-43 – MARKhI. Bottom right: Кп 501-44 – MARKhI

Figures. 4.11–4.13. 3 case studies of System of Visual Materials. (Gelatin Silver Prints). Sources: currently housed at the Canadian Centre for Architecture (CCA) and Moscow School of Architecture (MARKhI), VKhUTEMAS Collections. Archive No, top: PH1998:0014:014 – CCA, middle: PH1998:0014:011 – CCA, bottom: Кп 501-39 – MARKhI

Figures. 4.14–4.15. 2 case studies of System of Visual Materials. (Gelatin Silver Prints). Sources: currently housed at the Canadian Centre for Architecture CCA, Archive No, top: PH1998:0014:013 – CCA, bottom: PH1998:0014:012

Figure. 4.16. VKhUTEMAS students in the workshop of the Basic Preliminary Course, students during a Space course lesson. Exercise on the revelation of 'Mass and Weight' (1925). (Gelatin Silver Prints). Source: currently housed at the Moscow School of Architecture Museum, MARKhI, VKhUTEMAS Collection. Archive No: Unknown

Table. 4.17. Discipline Space models (types outlined by Krinskii and the proposed new types outlined by the author) (1923–1926). The table shows title descriptions from archival photographs exposing the wider setting for models constructed during Discipline Space. (Gelatin Silver Print) sources: currently housed at the Canadian Centre for Architecture (CCA), Moscow School of Architecture (MARKhI), Kiecken Gallery, Private Collection (I) (PC), constructed by the author based on the sourced archival photographs. Table constructed by author

Figures. 4.18–4.21. Four models for the type 'Surface' (Gelatin Silver Prints). Sources: currently housed at the Canadian Centre for Architecture, CCA, Moscow School of Architecture, MARKhI and Private Collection (I) PC, VKhUTEMAS Collections. Archive No, top left: PH1998:0014:025 – CCA. Top right: PH1998:0014:125 – CCA. Bottom right: FUND 1968 – PC and Кп 501-214 – MARKhI. Bottom right: PH1998:0014:044 – CCA

Figures. 4.23–4.25. 3 models for the type 'Form' (Gelatin Silver Prints). Source: currently housed at the Canadian Centre for Architecture CCA and Moscow School of Architecture, MARKhI. Archive no. Top: PH1998:0014:226 – CCA, bottom left: Кп 501-113 – MARKhI, bottom right: PH1998:0014:351 – CCA

Figures. 4.22–4.24. 3 models for the type 'Frontal Space' (Gelatin Silver Prints). Source: currently housed at the Canadian Centre for Architecture CCA. Archive No, Top left: PH1998:0014:267 – CCA, Top right: PH1998:0014:163 – CCA, bottom: PH1998:0014:195 – CCA

Figures. 4.25–4.27. 5 models for the type 'Space and Volume'. (Gelatin Silver Prints). Source: currently housed at the Canadian Centre for Architecture CCA. Archive No: top, PH1998:0014:218 – CCA, bottom left: PH1998:0014:257 – CCA, bottom right: PH1998:0014:253 – CCA

Figures 4.28–4.30. 3 models for the type 'Form' (Gelatin Silver Prints). Source: currently housed at the Canadian Centre for Architecture CCA and Moscow School of Architecture, MARKhI. Archive no. Top: PH1998:0014:226 – CCA, bottom left: Кп 501-113 –MARKhI, bottom right: PH1998:0014:205 – CCA

Figures. 4.31–4.33. 3 models for the type 'Mass and Weight' (Gelatin Silver Prints). Sources: currently housed at the Canadian Centre for Architecture CCA, Moscow School of Architecture

(MARKhI), Private Collection (I) (PC). Archive No, top left: PH1998:0014:246 – CCA, top right: FUND 2164 – PC, bottom: Кп 501-221 – MARKhI

Figures. 4.34–4.36. 3 models for the type 'Deep Space' (Gelatin Silver Prints). Sources: Currently housed at the Private Collection (I) PC and the Moscow School of Architecture, MARKhI. Archive No, top: FUND 2197 – PC, bottom left: Кп 501-141 – MARKhI and bottom right: FUND 6042 – PC

Figures. 4.37–4.39. Three models depicting the model for the type 'Transformation' (Gelatin Silver Prints). Sources: currently housed at the Canadian Centre for architecture and the Moscow School of Architecture MARKhI. Archive No, top left: PH1998:0014:332 – CCA, top right: Кп 501-66 – MARKhI and bottom: PH1998:0014:330 – CCA

Figure. 4.40. Victor Balikhin examining an unknown student's work (1923-1926) (Gelatin Silver Prints). Sources: currently housed at the Archive of A. V. Shchusev State Museum of Architecture MUAR. Archive No: Unknown

Figures. 4.41–4.42. Exhibition of Students work depicting a plethora of model themes (1923–1926) (Gelatin Silver Prints). Sources: currently housed at the Moscow School of Architecture, MARKhI. Archive No, top: Кп 501-016 – MARKhI, bottom: Кп 501-017 – MARKhI

Appendix

Table. A.2.1. Categories and stages for the Process of Discipline Space (1923-1926) and archival relationships to material in relation to stages of teaching, see (vol. II) for full account of material. Table constructed by author

Table. A.2.2. Purposeful sampling strategies and their operational definitions, source: (Patton, 1990, pp. 182-183)

Table. A.2.3. Coding four types (A) Workshop (Lecture Hall), (B) Model Type, (C) System of Visual Materials and (D) Exhibition of Student Works. Table constructed by author

Introduction

Background and Research Problems

The year 1917 was the year of the Russian Revolution, the first stage in the abdication of Czar Nicholas II, the collapse of Imperial Russia and the end of the Romanov Dynasty. The establishment of the Provisional government, an alliance between Liberals and Socialists who wanted to instigate political reform followed, but was soon overthrown by the events of the October Revolution, which gave power to the Soviets dominated by the Bolsheviks. The October Revolution, led by Vladimir Lenin (1870–1924) was a seizure of state power, instrumental in the larger Russian Revolution. It took place with an armed insurrection in Petrograd, traditionally dated 25th October, 1917. Bolshevik Red Guard forces, under the Military Revolutionary Committee, began the takeover of government buildings on 24th October. The Bolsheviks used their influence in the Petrograd Soviet to organise the armed forces. The long-awaited Constituent Assembly elections were held on 12th November, 1917. The Bolsheviks won only 175 seats in the 715 seat legislative bodies, coming in second behind the Socialist Revolutionary Party, which won 370 seats. The Constituent Assembly was to first meet on 28th November, 1917, but its convocation was delayed until 5th January, 1918 by the Bolsheviks. On its first and only day in session, the body rejected Soviet decrees on peace and land, and was dissolved the next day by order of the Congress of Soviets. The Revolution dismantled the Tsarist autocracy, but as the revolution was not universally recognised, the struggles of the Russian Civil War followed, beginning in 1917 and leading to the eventual rise of the Soviet Union in 1922. The basic compound of the Soviet order had been invented by Lenin and his fellow Communist leaders within a couple of years of the October Revolution. Leadership was a key virtue for them; if they wanted to prevail as the country's rulers, the

communists would have been pushed into introducing some kind of party-run state, even in the absence of a civil war – and, of course, the way that the October Revolution had occurred made a civil war virtually certain.[1] In Lenin's opinion, the peasantry had to be placated by the replacement of grain requisitioning with a tax on land.[2] In addition, the task-in-hand was to be set at a much lower level than the grain requisitioning quotas and would secure only the minimum of the state requirements on behalf of civilian consumers. These measures were the core of what quickly became known as the New Economic Policy (or NEP).[3]

Lenin who became the leader of the Bolshevik Revolution (7–8th November, 1917), and the new head of state in Russia, knew that in order to fulfil the communist ideals that he and his party had prescribed to, Russia had to be transformed into a worker's state, where education would be a paramount tool. Although little change occurred in the old academic systems in the year following the transference of power with human life in further decay and illiteracy increasing, steps were eventually taken to drastically alter education in the nascent socialist nation. The aim of the Soviet authorities had always been the building of a new kind of society, and they used educational systems, deliberately and consciously, as a means of attaining this goal.[4] The very geography of the country proved something of a hindrance to any regime attempting to achieve universal education.[5]

[1] Service, R. (2009), *The Penguin History of Modern Russia*, London: Penguin Books, pp. 123-124
[2] Ibid., p. 124
[3] Ibid., p. 125
[4] Grant, N. (1968), *Soviet Education*, Middlesex England: Penguin Books, p. 15
[5] Ibid., p. 16

One of the most prominent features of Soviet education, highlighting its difference from other

large-scale systems of mass education, is the extent of tight control exercised by the central

authorities.[6] As stated by Lenin:

> 'The real education of the masses can never be separated from their
> independent political, and especially revolutionary, struggle. Only
> struggle educates the exploited class. Only struggle discloses to it the
> magnitude of its own power, widens its horizon, enhances its abilities,
> clarifies its mind, and forges its will.'[7]

The People's Commissariat (ministry) of Enlightenment (Narkompros), the Soviet agency

charged with administration of public education, became a construct of the Bolshevik

government immediately after the 1917 revolution. The form of art schools in Russia after the

October Revolution had full state support. The expression 'experimentation welcome' seems to

have been the rallying cry of the policies for official art and education until Stalin took power.

One of the early stages in this development was the 'art program' developed by Anatolii

Lunacharskii (1875–1933). Lunacharskii – a 'westernised' revolutionary – was an intellectually

gifted leader. He and his advisors embarked on a highly radical reorganisation of education

throughout the country, where art and creative subjects in general were given special focus.

The link between art and industry was to be vital – orientating Post-Revolutionary Russian

Futurism towards an art of social utility. We have seen already the steps taken by the Soviet

government to revolutionise industry through design by improving education. This would lead

the way to the new proletarian art, a new era in art which would 'create new houses, new

streets and new objects of everyday life.'

Understanding the development of a new form of education through the history of an

institution or movement requires detailed knowledge of the context within which it emerged

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[6] Ibid., p. 32
[7] *Pravda*, no. 18, January 22, 1925, written in German before January 9 (22), 1917 as quoted in Lenin, V. (1964), *Lenin Collected Works*, Moscow, Progress Publishers, vol. 23, pp. 236-253. Source,
https://www.marxists.org/archive/lenin/works/1917/jan/09.htm (accessed 17th December 2016)

and occurred. The year 1918 witnessed reorganisation of the entire system of art education in the country, and creation of the Free Governmental Artistic Workshops (*Svobodnye Gosudarstvennye Khudozhestvennye Masterskie* – SGKhM – Free Art Studios), which were established in several Russian cities, including Moscow – the Stroganov School of Industrial and Applied Art (SKhPU), and Leningrad – the School of Painting, Sculpture and Architecture (UZhVZ). The First SGKhM contained several leading artists, primarily members of left movements who began to create a system of art education derived from the experience of the new art. The School of Painting, Sculpture and Architecture would be reorganised in the Second SGKhM (*Svobodnye Gosudarstvennye Khudozhestvennye Masterskie* – Second SGKhM – Free Arts Studios), existing alongside the first SGKhM continuation of development.[8] Following the second SGKhM's short existence, the schools would come to be formed as VKhUTEMAS (Higher State Artistic and Technical Studios) in 1920.

The creation of VKhUTEMAS began in October 1920 with NARKOMPOS, the Peoples Commissariat for Education, and became established in November 1920 by a state decree signed by Lenin.[9] It was to serve as a specialised educational institution to train highly qualified professional artists for careers in industry or education.[10] The first point of the decree stated the aims of VKhUTEMAS quite explicitly, 'The Moscow VKhUTEMAS is a specialised educational institution for advanced artistic and technical training, created to produce highly qualified artist-practitioners for modern industry, as well as instructors and directors of professional and technical education.'[11] According to Lodder, 'VKhUTEMAS has been a vibrant and politically engaged architectural institution during which time it can be divided roughly into three distinct

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[8] See Khan-Magomedov, S. O. (1993), *Psikhoanaliticheskiĭ metod N. Ladovskogo vo VKHUTEMASE-VKHUTEINE: ob"edinennye levye masterskie; psikhoanaliticheskaia laboratoriia*, Moskva: Arkhitektura
[9] TsGALI, fond 681, op. 2, ed. Khr. 25, list 21 as quoted in Lodder, C. (1983), *Russian Constructivism*, New Haven and London: Yale University Press, p. 112
[10] Lodder, *Russian Constructivism*, p. 112
[11] *Izvestiya VTsIK*, December 1920 as quoted in Lodder, *Russian Constructivism*, p. 112

periods, which correspond to the tenures of the three different rectors (Efim Ravdel, 1920–1923; Vladimir Favorskii, 1923–1926; and Pavel Novitskii, 1926–30), and with the 1927–1928 change in name from the VKhUTEMAS to the VKhUTEIN (Higher State Artistic and Technical Institute), which was accompanied by a changed set of statutes.'[12] In 1927, the school's name was modified; 'Institute' replaced 'Studios' or VKhUTEIN.[13] The VKhUTEMAS had put the issue of the change of name forward to Glavprofobr (the organ directing higher education) at the beginning of 1927, but the actual statutory change did not seem to take effect until 1928.[14] VKhUTEIN preserved the organisational [framework] of VKhUTEMAS, its staff of teachers, and its pedagogical principles. The question of renaming the VKhUTEMAS was raised by Narkompros on 9th September, 1925.

On reaching the age requirement, students were considered to be in military reserve but were deferred until completion of their educational obligations. Persons receiving deferment under Point 9, but failing to attend the educational institution were considered deserters and liable to prosecution under the provisions of martial law.[15] This resolution provided a clear indication of the high expectations held by the new government for cultural activities in Russia. The aim of the VKhUTEMAS, according to the resolution that had established the school, was 'to train artists of high quality for the benefit of the national economy.'[16] The changes were accompanied by development of a well-structured curriculum but, more importantly, marked a return to a more conservative academic tradition, increasingly reminiscent of the École des Beaux-Arts model, which it was originally created to oppose.

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[12] TsGALI, fond 681, op. 2. Ed. Khr. 22, list 97 as quotes in Lodder, *Russian Constructivism*, p. 113
[13] Cooke, C. (1995), *Russian Avant-Garde: Theories of Art, Architecture, and the City*, London: St Martins Press, p. 173
[14] Lodder, *Russian Constructivism*, p. 113, footnote 64
[15] *Izvestiya VTsIK*, December 1920 as quoted in Lodder, *Russian Constructivism*, p. 112
[16] Barron, S. and Tuchman, M. (1980), *The Avant-garde in Russia, 1910-1930: New Perspectives,* Los Angeles County Museum of Art, p. 78

Discipline Space, a course founded within the walls of VKhUTEMAS, offered one of the first

alternatives to the classical academic atelier and apprenticeship models of architectural

training developed by architect Nikolaii Ladovskii. Ladovskii was a Russian avant-garde

architect, educator and leader of the Soviet rationalist movement who became the creator of

teaching architectural Space as a form of architectural education.[17] At VKhUTEMAS, Ladovskii

harnessed and directed the immense creative energy of the post-revolutionary period, based

on perceptual psychology in what Ladovskii called (*ratsio-arkhitektura*) [ratio-architecture]. The

architects who accepted architectural rationalism Space as their method of design called

themselves 'Rationalists', through a new group called the Association of New Architects

(*Assotsiasiia novykh arkhitektorov*) or ASNOVA, within the VKhUTEMAS, which was commonly

called 'the Rationalist'. According to Khan-Magomedov, 'The development of Rationalism was a

process of overcoming neoclassicism and a full rejection not only of its forms but of all the

devices and methods of form-shaping associated with it.'[18] Rationalism insisted on the

necessity for the experimental discovery of the laws of perception of architectural forms,

which were to be followed by the development of a system of laws that allowed for a synthesis

of these forms into complex spatial compositions. In this manner, its implementation makes

absolutely clear the fundamental nature of architecture 'as a three-dimensional plastic-spatial

art' and thereby compels both student and architect to, 'reckon with the conditions of the

medium, objective, and material out of which a building is erected and which bind them into

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[17] Members of the Rationalist community, more specifically Ladovskii did achieve built work in Moscow around the same time and of the few buildings that Ladovski completed still standing in substantially unaltered state, none shows better his concern for symbolising in visually expressive spatial form the activity accommodated by a given structure than his 'Red Gate' entrance to the Moscow Metro, built in 1935. Only four physical structures were ever completed to Ladovskii's own, undisputed, design; three of them were eventually rebuilt beyond recognition: Underground halls of Lubyanka station of Moscow Metro, commissioned in 1935. Surface entrance to Krasniye Vorota station, 1935 and two residential buildings inside the block at 6, Tverskaya Street, designed in 1928 and completed in 1931. For further reading seen Khan-Magomedov, (2007), *Ratsionalizm* [Ratio-arkhitektura] *'Formlalizm'* [Rationalism (Ratio-architecture) 'Formalism'], Moskva: Arkhitektura-S

[18] Khan-Magomedov, *Psikhoanaliticheskiĭ metod N. Ladovskogo vo VKHUTEMASE-VKHUTEINE: ob"edinennye levye masterskie; psikhoanaliticheskaia laboratoriia*, p. 187

an integral architectural organism of the formal idea, supplied by the architect-artist.'[19] The progressive design methodology of Space (*Prostranstvo*), taught by him and other Rationalists, served as an entry for Soviet avant-garde architecture.

The first mention of Ladovskii's theory of Space occurred during a spring evening in 1920 in a cold, poorly-lit room at the Second Independent State Artistic Workshops (*Svobodnye Gosydarstvennye Khudozhestvennye Masterskie, SGKhM*) in Moscow, the outpost of Soviet artistic avant-garde in post-revolutionary Russia. Unlike the departments of Painting and Sculpture, the Architecture Department was still run by traditionalists. Unknown to anybody in the audience, the future leader of the Rationalist movement, Ladovskii, stood to speak. He explained the drawbacks of the old stylistic academic approach to architectural education, which he condemned as a passive imitation that kills live imagination and destroys one's desire to apprehend the real laws and methods of architectural creation. The students in the room were struck by Ladovskii's maxim, 'Space, not stone, is the material of architecture,' which defines the discipline as work within the context of subjective perception.[20] Ladovskii would urge students to think, not about the orders and proportions, but about the human who perceives them, arguing that only human emotional and visual perception can form the basis of architectural composition; a position that would later become the cornerstone of Rationalist teaching.[21]

The approach to Space would be taught by Ladovskii, with his two colleagues Nikolai Dokuchaev (1891–1944) and Vladimir Krinskii (1890–1971). The three teachers approached,

[19] Dokuchaev, N. A. (1927), *Sovremennaia russkaia arkhitektura i zapadnye paralleli* [Contemporary Russian architecture and (its) Westem parallels], *Sovetskoe iskusstvo* [Soviet Art], no. 2, p. 13 as quoted in Senkevitch, Jr. A. (1974), *Trends in Soviet Architectural Thought, 1917-1932: The Growth and Decline of the Constructionist and Rationalist Movements*, PhD diss, Cornell University: U.S, p. 343

[20] Khan-Magomedov, *Ratsionalizm* [Ratio-arkhitektura] *'Formlalizm'* [Rationalism (Ratio-architecture) 'Formalism'], pp. 140-143

[21] Krinskii, V. F. (1969), 'Vozniknovenie i zhizn' Assotsiatsii novykh arkhitektorov—ASNOVA' [The Emergence and Life of the Association of New Architects—ASNOVA], *Sovetskaia arkhitektura*, no. 18, pp. 20-28

developed and implemented a new form of architectural teaching at VKhUTEMAS through OBMAS (*Obedinennye levye masterskie*, 1921–1923), a workshop set up specifically to test and develop new concepts of spatial form. Ladovskii devised a new approach to architectural teaching through developing core areas of teaching being: 'Process', 'Sequence' and 'Model-Format'.

Ladovskii's impetus was his focus on the concept of Space, which would be successfully developed via his theory of architecture and the psycho-analytical method within OBMAS. The psycho-analytical method, developed continuously by Ladovskii from 1920, was the basis of his fundamental curriculum to pedagogy. The method was aimed at a scientific and rational explanation for the influence of colour, form and space, and the influence of their combination on the human psyche, and would rely on the psychophysiological studies of visual perception and visual orientation in Space.

Khan-Magomedov describes conversations with Ladovskii's students in his book *Arkhitektura sovetskogo avangarda [Architecture of Soviet avant-garde: Problems of Formation Master and Flow],* which pointed to Ladovskii's intellect during OBMAS, 'I talked with many of Ladovskii's students and almost all of them mentioned that he was an amazing leader. He was so creative with the challenges posed orally presenting tasks that can be solved only by creating a very distinctive three-dimensional composition.'[22] Krinskii stated, 'I well remember our first meeting in the architectural office of the Moscow Soviet, where Ladovskii was working. He made a profound impression on me; he conducted himself in a very calm and polite manner. In brief and precise phrases, Ladovskii outlined the situation of the office and its workers, and spoke of the need to create a new architecture. Ladovskii possessed a highly rationalistic turn of mind,

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[22] Khan-Magomedov, S. O. (1996), *Arkhitektura sovetskogo avangarda* [Architecture of Soviet avant-garde: Problems of Formation Master and Flow], Moskva: Stroiizdat, pp. 222-223

which cast a specific stamp on his work; it proceeded to a far greater degree from intellect than from emotion. Unconditionally casting aside stylisation or the use of old architectural forms, he moved toward a new architecture by way of a rationalistic analysis of artistic phenomena.'[23] Khan-Magomedov adds, 'It is clear from Ladovskii's output and teaching that he was gifted with fine artistry and intuition and was no mere Rationalist in matters of form. The secret of Ladovskii's pedagogy resided in his ability to induce this creative state of mind in a pupil.'[24] The three years of OBMAS developed a course curriculum to become implemented as a core curriculum within the walls of VKhUTEMAS.

The transition from testing and developing the theory and pedagogy of Space through OBMAS to the creation of the Basic Preliminary Course resulted in the introduction of Discipline Space within VKhUTEMAS (1923–1930). Once the course became established, Ladovskii and Dokuchaev moved to the architecture department, leaving only Krinskii and the students of OBMAS to continue Ladovskii's prior development of Space teaching. Their interpretation was to implement Rationalist theory and the new form of pedagogy devised within the newly-formed Discipline to the mass teaching. Besides Ladovskii's teaching during OBMAS, the Basic Preliminary Course became an important part of the new pedagogical method that was developed at VKhUTEMAS and was made compulsory for all students, regardless of their future specialisation. First-year students were required to complete the Basic Preliminary Course. This pedagogy was a consequence of the Soviet mass educational mandate and the large numbers of students, who could no longer be trained in the traditional one-on-one method. It prepared experts on all the specialties, not only architects but skilled artists on subjects which were

[23] Krinskii, 'Vozniknovenie i zhizn' Assotsiatsii novykh arkhitektorov—ASNOVA' (The Emergence and Life of the Association of New Architects— ASNOVA), *Sovetskaia arkhitektura*, p. 20 as quoted in Senkevitch, *Trends in Soviet Architectural Thought, 1917-1932 The Growth and Decline of Constructivism and Rationalist Movement*, p. 331
[24] Khan-Magomedov, S. O. (1987), *Pioneers of Soviet architecture: the search for new solutions in the 1920s and 1930s*, London: Thames and Hudson, p. 143

common for everybody: Space (Krinskii), 'Graphics' (Alexander Rodchenko, 1891-1956), 'Color'
(Alexander Vesnin, 1883-1959 and Lyubov Popova, 1889-1924 further on Gustav Klutsis, 1895-
1938) and 'Volume' (Anton Lavinskii 1893-1968 and Boris Korolev, 1884-1963).[25] As
acknowledged by Khan-Magomedov, 'the subject Space was the key teacher in architectural-
artistic education.'[26]

According to Khan-Magomedov, 'In 1923, when an autonomous Basic Preliminary Course was
created within the structure of VKhUTEMAS and instructors were needed to staff the
interdisciplinary course Space, created on the basis of the psycho-analytic method, Ladovskii
recommended students from the first group at OBMAS–Balikhin: Mikhail Korzhev (1897–1984),
Victor Petrov and Mikhail Turkus (1900–80), Ivan Lamtsov (1899–1989), Sergei Glagolev, and
Iurii Spasskii.'[27] Ladovskii's pupils held key positions from the point of view of their ability to
influence the general form-shaping process in object-artistic creation, and especially in
architecture. All students in the architectural faculty passed through the hands of these pupils
of Ladovskii, executing exercises according to the very program that Ladovskii had worked out
with his own pupils at OBMAS.[28]

The transfer of responsibility to the above teachers and their role, implementation and
continuation of theory and pedagogy are not fully understood and has only been viewed
historically. For historical assessment of this period, the impact of continuity and discontinuity
in the pedagogy must be addressed. The difference between historical (concerning history or
past events) and pedagogy (the term derived from elementary levels of architectural teaching)
is of vital importance to the research as the latter is the focus of the core aims of the research,

[25] Ovsyaannikova, E. and Shukhov, V. (2013), 'Phenomenon of the Russian Avant-garde Moscow Architectural School of the 1920's', *Docomomo International Journal*, Issue 49, pp. 23-24
[26] Ibid., p. 24
[27] Khan-Magomedov, *Psikhoanaliticheskiĭ metod N. Ladovskogo vo VKHUTEMASE-VKHUTEINE: ob"edinennye levye masterskie; psikhoanaliticheskaia laboratoriia*, p. 195
[28] Ibid

distancing itself from academic interpretations that have already been portrayed. The apparent

focus on Ladovskii's theory and pedagogy is quite revealing as very little similar detail can be

identified of how Discipline Space is taught (1923–1926). The aim of the thesis in terms of its

pedagogical context is to shed light on the teaching and the students work during this period,

offering a new reading of the teaching of Discipline Space through using Ladovskii's theory and

teaching to portray how Discipline Space is taught.

Research Questions

The pedagogical analysis of how Discipline Space came to be taught between 1923–1926 offers

a new reading of Soviet architectural teaching which has remained unexplored. The four

research questions for the thesis are outlined below:

1. How, and in which evolving pedagogical context, did Discipline Space come to be taught
between 1923–1926 at VKhUTEMAS?

2. How did Ladovskii's theory and pedagogy affect Discipline Space teaching, particularly in the
three areas identified by Khan-Magomedov (Process, Sequence and Model-format), which in
turn helped students' learning of Space?

3. What impact, if any, did the mass shift have on Discipline Space teaching?

4. What impact, if any, did use of the model have on the students' learning of Space?

Scope of Research

This study is not intended as a history of Discipline Space or as a monographic treatment of

individual Soviet ideas. Rather, it has been conceived to illuminate the leading theories and

principles of Soviet pedagogy through the four years under consideration (1923–1926). This

work is concerned chiefly with how the teaching methods were delivered, ideas of

architectural teaching and student works through use of the model.

The inclusion of a detailed account of the teaching of Ladovskii (1921-1923) will first set the

scene from the beginning of the thesis. What will be discussed will in turn be included in a

comparison between both pedagogical settings in the later stages of the thesis which will be used to expose the core pedagogical functions of Discipline Space teaching, justifying the importance for the inclusion covered in a single chapter.

The literature review on Discipline Space will remain central after the pedagogical teaching of Ladovskii has become acknowledged, exposing the gaps within the debate proposing how both settings of teaching is to become bridged, framing how each can be brought together to portray how Discipline Space is taught.

The chosen archival approach will follow after the literature review and is important to the research providing a primary entry into the thesis. The primary approach requires an additional chapter to frame what material is found and to be stored in a constructed repository (vol. II). Without such a focussed archival approach would only result in short-sighted and mis understood findings based on secondary sources causing the inclusion of archival material to be central to the research success. Each of the three chapters will become established before reaching the core chapters and are central to exposing how Discipline Space is taught. Without such inclusion would weaken the research output.

Throughout the research, there are areas of possible connection to the period of the 1920's which have been omitted entirely. Any direct connection to the Bauhaus School of Architecture (1919-1933) has been omitted, as Bauhaus did not have an architecture department until 1927 causing the periods of comparisons not to be attempted (see section 7.4).

A discussion of any Constructivist developments in Soviet pedagogy is intentionally lacking beyond the archival focus. To have included a parallel treatment of Constructivist theories, which the subject matter rightly deserves, would have expanded the scope of the present work beyond manageable limits. A discussion of pedagogy today has also deliberately been omitted

due to the substantial leap from 1923–1926 to 2018, which is too broad a period to attempt through the archival focus of research. The author argues that the research should stay within the period of VKhUTEMAS to capture best the spirit of the revolutionary teaching methods of Space.

Research Limitations

The focus of Ladovskii's theory and pedagogy analysis has limited the scope of the study and only three areas of pedagogy – process, sequence, model-format – were conducted and associated with Discipline Space, which have provided an interpretable base for Discipline Space to begin. The archival findings on pedagogical methods of Krinskii, amongst other teachers of Discipline Space, provide a framed limitation and have not been preserved in archives or in past literature. Acquiring such material will allow deeper pedagogical connections to be established between each area of teaching.

Potential Contribution to Knowledge

This research aims to increase our understanding of the Soviet teaching methods of a discipline orientated towards architecture for mass teaching. Moreover, increasing understanding of the pedagogy during Discipline Space could, potentially, result in greater understanding of the teaching during those times and its impact on Soviet architecture. This, in turn, could provide a better understanding of the pedagogical interpretation of the period, allowing academic debate to be repositioned. Availability of archival material and the apparent assumptions of past scholars relating to a little-known discipline presents a unique opportunity to provide 'fresh' and 'solid' research understanding. The process of archival research is the primary driver for the thesis. The amount of material collected in the research repository has never been previously attempted by any institution or scholar. This wide selection of material is

framed through its full account for the very first time, but with acknowledged limitations (see 3.4.1).

Portraying how Discipline Space came to be taught by bridging the gap between Ladovskii's theory/pedagogy and Discipline Space teaching will clarify whether Ladovskii's prior theory and pedagogy was taught and how the teaching is taught during Discipline Space. This contribution will provide a detailed understanding of the two settings of teaching which have remained separate, exposing a 'pocket' of pedagogical facts of how Discipline Space is taught when the two are brought together (chapter 6). In this sense, the approach adopted in this research is a methodological contribution, from an archival perspective, to the knowledge on Discipline Space teaching.

Overview of Thesis Structure

This thesis comprises six chapters: (1) Ladovskii's psycho-analytical method (*Psikhoanaliticheskiĭ metod*) and pedagogy (1921–1923), (2) Discipline Space (1923–1926), (3) archival material (1923–1926), (4) case studies, analysis and assessment, (5) discussion, and (6) conclusion.

Chapter 1 explores existing scholarship and provides a contextual review of the approaches and methods of Ladovskii's psycho-analytical theory and pedagogy covering the definition of Space, Rationalism, the influence of the arts through the development of Rationalist Space, Space teaching and the inclusion of the psycho-analytical [Framework] within the teaching of Space.

Chapter 2 introduces Discipline Space (1923–1926) focussing on the literature review which begins by defining Discipline Space, followed by the scope and approaches to studying Discipline Space, the gaps in Discipline Space research through studying its pedagogy, gaps

between Ladovskii's Psycho-analytical theory/pedagogy (1921–1923) and Discipline Space (1923–1926), and the potential links to be established between both.

Chapter 3 presents the archival research through the approach to archival research, data collection [documentation and process], and the repository construction.

Chapter 4 presents the results of the research findings through a general introduction, the chosen case studies, followed by process, sequence and model-format analysis, and finishing on Discipline Space assessment.

Chapter 5 provides discussions through comparisons between both settings of pedagogy through Ladovskii's theory and teaching (OBMAS 1921–1923) and Discipline Space (1923–1926) covering the three areas of teaching. The chapter then finishes on an assessment of the research comparison findings.

Chapter 6 summarises the key findings of the research in relation to the research questions and argues further for their significance and contribution to knowledge. The chapter finishes by discussing the findings of the study, the significance and contribution to the study, the applicability of the research design and [framework] and the wider relevance and potential future research.

Chapter I

'Architecture is an art operating with space. Sculpture is an art operating with form'[29]

Ladovskii's Psycho-analytical Method (*Psikhoanaliticheskiĭ Metod*) and Pedagogy (1921–1923)

1.1 Introduction

The study of Ladovskii's psycho-analytical method and pedagogy has been multidisciplinary through its development; therefore, this chapter contemplates a variety of perspectives, focussing specifically on the core context and literature of both his psycho-analytical method and his teaching. Reference to Ladovskii's early development will be included to provide wider theoretical groundwork which played a factor towards his theory and teaching. In this regard, the chapter begins by focussing separately on the definitions of both Space and Rationalism. It then discusses the scope and approach to Rationalist Space theory through the Arts, the scope of Space pedagogy, and the approach to the psycho-analytical [framework] within Space pedagogy (1921–1923). It will discuss three areas of Ladovskii's teaching with a brief account on the core elements within Ladovskii's pedagogy through his [framework] of 'Expressive Qualities'. The chapter positions the development of his inception of theory and pedagogy to frame the context of development up until 1923.

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[29] Extract from speech at Zhivskul'ptarkh meeting in 1919 as quoted in Khan-Magomedov, *Pioneers of Soviet architecture: the search for new solutions in the 1920s and 1930s*, p. 543

1.2 Defining Space (*Prostrastvennyi*)

In terms of Ladovskii's theory of Space, a multitude of definitions were proposed during its development between 1919–1923. No one single definition of the entire theory exists, making it difficult to define precisely through a short account. The author attempts to establish a solid understanding of what the term was and how it was developed by him and his associates. In the later stages of this section, a broader inclusion of the term Space is seen through architecture of a similar period, to position the term Space into the wider context.

What has been sourced is a rich selection of visionary quotes by Ladovskii and his associates, Dokuchaev and Krinskii during different periods of development to define the Rationalist form of architecture. The author has chosen a selection that captures the development and relationship of the definition of Space. To begin with, during a Zhivskul'ptarkh (Collective for the Synthesis of Painting, Sculpture and Architecture) meeting in 1919, in one of the earliest accounts of Space during its development, Ladovskii stated:

'Although space figures in all aspects of art, architecture alone makes it possible to read space correctly. Construction only plays a part in architecture in so far as it defines the concept of space. A constructor's basic principle is to invest a minimum of materials and achieve maximum results. This has nothing in common with art and can only satisfy the requirements of architecture by chance.'[30]

Ladovskii had in mind a kind of spatial coordinate system, which operated in the three dimensions over time as a common perceptual framework for designer and observer alike. During the same period of experimentation, Ladovskii stated, 'The marvels of modern times soaring in space will be by art plus mind, and their chief component will be the mind.[31] This was proclaimed Ladovskii appended to the design of his communal house in 1920 during Zhivskul'ptarkh, whereby his interpretation of Space was drawn in two dimensions. Ladovskii's

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[30] Ibid

[31] Note appended to the design of a communal house 1920 as quoted in Khan-Magomedov, *Pioneers of Soviet architecture: the search for new solutions in the 1920s and 1930s*, p. 544

other associate, Dokuchaev; described architectural Space as one 'conceived as being an integral and continuous spatial expanse in width, height, and depth, organised and designed by means of the forms, their colouration and arrangement.' It was, in other words, essentially 'a kind of hollow, plastic phenomenon filled with volumetric objects.'[32] In comparison with Ladovskii's term in 1920 through Zhivskul'ptarkh, whereby Space was still being developed through two-dimensional drawing, the notion of a 'plastic hollow form' is more applicable to perceiving and constructing Space in three dimensions, allowing Space to be perceived correctly. In 1921, during an INKhUK meeting (*Institut khudozhestvennoi kul'tury* – Institute of Artistic Culture, 1921-1924), Ladovskii expanded on his definition, stating:

> 'The task that faces us is the study of the elements, qualities and properties of architecture….The most important elements in architecture are space, construction, form; and the rest of its elements merely follow these.'[33]

The position of Space became the central driving concept for a new architectural language at this point in its development. In 1921 Ladovskii also proclaimed, 'Space, not stone, is the material of architecture.'[34]

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[32] Dokuchaev, V. N. (1927), *Metoaicheskaia zapiska po kursu 'Osnovy arkhitektury* [Methodical Notes on the Course 'Foundations of Architecture'] in *Sbornik materialov po khudozhestvennomu obrazovaniru* [Collections of Materials on Art Education], Moscow: Gos Izd, pp. 101-102 as quoted in Senkevitch, Jr. A. (1983), 'Aspects of Spatial Form and Perceptual Psychology in the Doctrine of the Rationalist Movement in Soviet Architecture in the 1920's', via, n6, *Architecture and Visual Perception (The Journal of the Graduate School of Fine Arts, University of Pennsylvania)*, p. 102

[33] Extract from a lecture to the INKhUK Working Group of Architects 1921 as quoted in Khan-Magomedov, *Pioneers of Soviet architecture: the search for new solutions in the 1920s and 1930s*, p. 544

[34] Quoted by Cooke, Catherine. 'Ladovskii, Nikolai (Aleksandrovich)', Grove Art Online www.groveart.com , Oxford University Press (accessed May 16, 2016)

During the same year, the second associate of Ladovskii, Krinskii, provided an alternative

interpretation of his own during INKhUK, exposing the pedagogical development within the

rationalist movement:

> 'Its purpose in architecture, sculpture, painting is to lead to the problem of perception of Space. The purpose of the abstract form is a pure and theoretical one. That is, a theory of form in general; a scientific discipline of the process of thought in space. To apply or adapt the abstract form to reality is impossible. The cube, the cylinder, the cone are not forms but concepts, with which we arrive at a given concrete form. It is not an idea given and…It is our way of thinking in real space. Any abstract form resolved is our attempt to resolve space'[35]

During the same discussion Krinskii further stated:

> 'What then is resolved by an abstract form? It undoubtably has only one aim: the problem of the perception of form in architecture, sculpture and painting comes down to the perception of space. The aim of abstract form is purely theoretical. It is the theory of form in generalised terms. *The scientific discipline is to think in space*. One cannot apply abstract form to reality, or utilise it. A cube, a cylinder or a cone are not forms, but concepts with which we resolve a given form. This is not a predetermined idea. It is our way of speculating about real space. Yet every abstract form resolved represents a formulation of our experience of space. And we are thus forced to recognise that there can be no predetermined idea before a set architectural task has been resolved and its conditions have been studied.'[36]

The selection of terms through the variety of definitions exposes the approach and freedom of

creation directly to a three-dimensional form within which Space can be constructed. The term

'Space' at this point is abstract. From 1921–1923 there appears to have been many different

terms, with such definitions revealed in the one-time publication (designing by El Lissitzkii)

Osnovy postroenija teorii arhitektury Izvestiia ASNOVA (1926).

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[35] Krinskii from his INKhUK report, '*Put arkhitektury*' [the path of architecture], in Mastera sovetskoi arkhitektury ob arkhitekture (Masters of Soviet architecture on architecture), Moscow 1975, vol. 2, pp. 116-117 as quoted in Khan-Magomedov, S. O. (1986), *Rodchenko: the Complete Works,* London: Thames and Hudson, p. 42

[36] Extract from a lecture to the INKhUK Working Group of Architects on, '*The Path of Architecture*', May 1921 as quotes in Khan-Magomedov, *Pioneers of Soviet architecture: the search for new solutions in the 1920s and 1930s*, p. 590

The architectural publication which was published after the theory of Space through the rationalists' levels has been developed pedagogically during OBMAS revealing more focus through the development of definitions. Ladovskii stated:

'Architect designs shape by adding elements that are neither "technical" nor "utilitarian" – elements that can be broadly defined as setting architectural motives. These motives must be rational and must serve the utmost human need – *the need to orient in space.*'[37]

Ladovskii continued by saying, 'It is in Space that the soaring wonders of modernity will be built by art plus the intellect.' 'When an architect is contemplating any problem of building, he must initially organize only space, disregarding materials or construction, and only start to think about these later: this makes work easier, and the results will be neater and better'.[38]

According to more contemporary scholars, Senkevitch states, 'Ladovskii's concept of Space followed a complex but fascinating route in arriving at his particular conception of spatial form, penetrating to the core of innovative developments in contemporary Soviet and western avant-garde art.'[39] As stated in the work by Khan-Magomedov, 'Ladovskii professed a new image of the architect as the creator of dynamic spatial environments capable of eliciting aesthetic responses. The observer's awareness of Space, regarded as a key factor in the aesthetic appreciation of architecture, was seen as a response not merely to the physical area or volume of an enclosure, but to the kind of feeling it evokes about the quality of the space flowing through and beyond it as well.'[40] Continuing this, a further scholar Vronskaya adds, 'Thus, asserting Space as the building block of a new architecture, Ladovskii not only redefined

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[37] Extracted from the article Ladovskii, N. A. (1926), *Osnovy postroenija teorii arhitektury* [Foundations for building a theory of architecture] Proceedings of the Association of New Architects, Izvestiia ASNOVA*, p. 3
[38] Ibid
[39] Senkevitch, '*Aspects of Spatial Form and Perceptual Psychology in the Doctrine of the Rationalist Movement in Soviet Architecture in the 1920's'*, p. 80
[40] Ibid., p. 102

it as working with subjective images rather than material objects, but also pointed to the

methods of psychological manipulation, developed by scientists, as suitable instruments of

architectural work.'[41] According to Senkevitch, 'The Space that loomed as the object of the

Rationalists' concerns was not the real space found in nature, which Dokuchaev called

'undesigned' Space, but real space modulated and transformed into *architectural* space.'[42]

Ladovskii's, Dokuchaev's and Krinskii's notion of Space is divided between the sculptural, with

less emphasis on the notion of material, and exposing the development of Space after the

testing and development had occurred before and during OBMAS, providing a focussed

approach to what Space is. What remain applicable are the different interpretations between

each, exposing the abstract approach and progressive development of a new theory orientated

towards architecture with a pedagogical focus. It is important to acknowledge, each definition

is an interpretation, no single definition is applicable in defining Space accurately with the

Ladovskii, Dokuchaev and Krinskii definitions remaining positioned under the umbrella term

Space. The context of Space developed by Ladovskii and his associates shows that the term did

not remain static with a variety of definitions used to develop and explain what had been

developed over a set number of years before and during its implementation into architectural

teaching. It is evident these overlapping definitions were used with precision in literature,

exposing the evolution of rationalist Space theory since its inception.

Through the plethora of terms outlined by Ladovskii, Dokuchaev and Krinskii between 1919–

1923, other architects and other interpretations by scholars can also be seen to have proposed

their own interpretations of what Space was meant to be. Moholy-Nagy, in charge of the

curriculum at the Bauhaus, was faced with the problem of how, if 'space' were the true subject

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[41] Vronskaya, A. (2014), *The productive unconscious: architecture, experimental psychology and the techniques of subjectivity in Soviet Russia, 1919-1935*, PhD diss, MIT University: U.S, p. 60
[42] Senkevitch, '*Aspects of Spatial Form and Perceptual Psychology in the Doctrine of the Rationalist Movement in Soviet Architecture in the 1920's'*, p. 102

of architecture, it was to be taught.[43] 'The root of architecture', wrote Moholy, 'lies in the problem of the mastery of space which, given that aesthetics had declared architecture to be an art of space, but left it to architects to make it happen, was indeed true'.[44] Following August Schmarsow (1853–1936) and the psychologists, Moholy accepted that space was a biological faculty but, following Alois Riegl (1858-1905) and Schmarsow, recognised that 'spatiality' was historically conditioned, and specific to each period of history. The task of architecture was therefore to bring to mankind awareness of the present consciousness of space.[45] In describing how space was to be understood, he explicitly rejected the notion that it was enclosure, 'It will not be long before ... architecture will be understood not as a complex of inner spaces, not merely as a shelter from the cold and from danger, nor as a fixed enclosure, as an unalterable arrangement of rooms, but as an organic component in living, as a creation in the mastery of space experience.'[46]

By 1920 the term Space was well established as a category in the art and architectural vocabulary, but in terms of built work, there was little to be seen that could be said to justify the claim that architecture was an art, not of materials, but of Space.[47] This immediately presents a problem for an English-language discussion of the subject, because the German word for Space, *Raum* or *Raumgefohl*, at once signifies a material enclosure, a 'room', and a philosophical concept.[48] The German interpretation of Space as the development of Space in an architectural category, first appeared in Germany, and it is to German writers that one must turn for its origins and purposes.[49] As stated by Malathouni, 'The earliest explicit use of the term Space in a principal architectural category has been dated to the early 1890s and

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[43] Forty, A. (2000), *Word and Buildings: A Vocabulary of Modern Architecture*, Thames and Hudson: London, UK, p. 266
[44] Ibid., pp. 266-267
[45] Ibid., p. 267
[46] Ibid
[47] Ibid., p. 265
[48] Ibid
[49] Ibid., p. 256

attributed to a small group of German aesthetic philosophers.'[50] Its adoption is intimately connected with the development of modernism, and whatever it means, therefore, belongs to the specific historical circumstances of modernism, just like the case with the partners of Space, 'form' and 'design'.[51]

More than anyone else, it was German architect and theorist Gottfried Semper (1803-1879) who was responsible for the introduction of Space as the principal type of modern architecture. Other architects saw spatial enclosure purely in terms of interior – the works of Camillo Sitte (1843–1903) portrayed the type of architecture as exterior Space.[52] This insight, that Space belonged not only inside buildings, but also outside them, was to be crucial during the 1920s. The new conceptions of Space in modern architecture began with Wright's interpenetration of Space. They encompass such well-known innovations as Theo Van Doesburg's and Gerritt Rietveld's (1888–1964) rectilinear organisation of planes, conceived as layered and articulated elements in Space; Mies van der Robe's horizontally centrifugal spatial arrangements, subdivided and articulated by freestanding planes and columns; and Le Corbusier's Purist layering of frontalised planes in Space; playing with literal and phenomenal transparency.[53]

It has been observed that the term Space as created by Ladovskii is well positioned within the setting of Space in architecture, with the focus remaining more on the perception of Space as opposed to its material function. The development of Space through Ladovskii and his associates appeared at times influenced through different perspectives. This made the approach and development unique within the setting of architectural Space through its

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[50] Malathouni, C. (2013), 'Architecture is the pattern of human mind in space: Claude F. Bragdon and the spatial concept of architecture', *The Journal of Architecture*, 18 (4), p. 553
[51] Forty, *Words and Buildings: A Vocabulary of Modern Architecture*, p. 256
[52] Ibid., p. 258
[53] Senkevitch, '*Aspects of Spatial Form and Perceptual Psychology in the Doctrine of the Rationalist Movement in Soviet Architecture in the 1920's'*, p. 111, note (2)

overlapping development within its intentions set in a pedagogical focus with the primary

material being found in Space.

1.3 Defining Rationalism (Ratio-Architecture *Ratsio-arkhitektura*)

The Rationalist movement obtained its name from the theory of 'rational' architecture

developed by Ladovskii and his associates. The movement was acknowledged as a prominent

movement within the development of architecture and architectural pedagogy of the 1920s.

The movement of Rationalism recalled its prime impetus through a group of architects,

ASNOVA, 'is an organisation [consisting] of a small group of architects with a specific ideology,'

but one whose essence simply 'revolves around experimenting with an abstract form that is

purely aesthetic in nature'.[54] Defining his conception of 'rational' architecture, Ladovskii stated:

> 'Architectural rationalism is based upon an economic principle just as is technological
> rationalism. The difference stems from the fact that technological rationalism represents the
> economy of labour and material in the creation of an expedient structure, while architectural
> rationalism represents the economy of psychic energy in the perception of the spatial and
> functional properties of a building. The synthesis of these two rationales in a single structure,
> then, constitutes a rational architecture (*ratsio-arkhitektura*).'[55]

Ladovskii and the Rationalists sought primarily to establish verifiable scientific criteria for

perceiving and articulating architectural form in space as the basis for architectural design.[56]

According to Senkevitch, 'In espousing a rational architecture, Ladovskii and his colleagues,

Dokuchaev and Krinskii, had in mind the development of objective laws for rendering

architectural form on the basis of exploiting the psychological and physiological peculiarities of

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[54] Senkevitch, *Trends in Soviet Architectural Thought, 1917-1932 The Growth and Decline of Constructivism and Rationalist Movement*, p. 218

[55] Ladovskii, N. A. (1926), *Osnovy Postroeniia teorii arkhitektury (pod znakom ratsionalisticheskoi estetiki)* [The Foundation for Constructing a Theory of Architecture (Under the Banner of a Rationalist Aesthetic)], Izvestiia ASNOVA, no. 1, p. 3, translation by author, Russian original: Архитектура оперирует этими 'качествами' как определенными величинами. Архитектор конструирует форму внося элементы, которые не являются техническими или утилитарными в обычном смысле слова и которые можно рассматривать как 'архитектурные мотивы'. В архитектурном отноше нии эти 'мотивы' должны быть рациональны и служить высшей технической потребности человека
ориентироваться в пространстве

[56] Senkevitch, *Trends in Soviet Architectural Thought, 1917-1932 The Growth and Decline of Constructivism and Rationalist Movement*, pp. 300-301

man's perception of form in space.'[57] The term Rationalism held a strong presence in the way

Space would be constructed and perceived through the economy of energy, allowing the

concept of Space to be channelled into a movement for the purpose of architectural education

within a new form of architectural pedagogy. Continued by Senkevitch, 'The group of

"Rationalist" architects is a product of our times, full of dynamism and energy. We are thus

bound by the introduction into contemporary architecture of the understanding of time as the

fourth dimension, characterising the volumetric and spatial aspects of architectural form,

taking into account the fact that, in creating buildings of enormous size, the contemporary

architect is at the same time compelled to consider space as well— he must know how to

reveal and organise it for the contemporary consumer of architecture who does not have the

capacity to grasp and perceive this space at once due to its great expanse.'[58]

The development of Rationalisation of perception became Ladovskii's major preoccupation,

which encompassed the development of a new visual language for architecture, establishing

relationships between physiological sensation and visual form, and developing new

pedagogical methods. According to Vronskaya, 'This ambition to rationalise perception as a

valuable state property, making it more efficient and economical, was reflected in the

expression "rational architecture" (*ratsional 'naia arkhitektura*; ratsio-arkhitektura), which the

group used to describe its methodology, and which subsequently led to emergence of the term

"Rationalism". The latter allowed subsequent scholars to avoid using the derogatory

"Formalism", a nickname given to the group by their major rivals, the Constructivists, and

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[57] Senkevitch, *Trends in Soviet Architectural Thought, 1917-1932 The Growth and Decline of Constructivism and Rationalist Movement*, p. 301
[58] Dokuchaev, *Sovremennaia russkaia arkhitektura i zapadnye paralleli* [Contemporary Russian architecture and its Western parallels] as quotes in Senkevitch, *Trends in Soviet Architectural Thought, 1917-1932 The Growth and Decline of Constructivism and Rationalist Movement,* p. 385

frequently used in the 1920s and 1930s.'[59] According to Khan-Magomedov, 'For the

Rationalists, construction, technology and material were important but only secondary issues.

The Rationalists were, not unexpectedly, accused by their detractors of being formalists, a term

that was consistently applied to the movement because of its alleged preoccupation with

architectural form at the expense of content and concrete social circumstances. The

Rationalists saw a dynamic level of permeability and the interpenetration of space that it

suggests is a vital means for emphasising the aesthetic and perceptual power of space.

Exploring this aspect of the problem was one of the prime objectives of the VKhUTEMAS design

exercises in expressing and manipulating space.'[60] Ladovskii claimed that the most important

factor in the generation of form was Space.[61]

1.4 The Approach to Rationalist Space Theory through the Arts

Ladovskii, Dokuchaev, and Krinskii began their search for a new means of expression by

experimenting with the latest formal achievements of Cubism (1907–1911), attempting to find

basic opportunities for creating a new architecture. Having rejected the old classical

architectural theory, Ladovskii and his associates needed to create a foundation for a new

theoretical building. In his dissertation, *Trends in Soviet Architectural Thought, 1917–1932, The

Growth and Decline of Constructivism and Rationalist Movement*, Senkevitch states that, 'Initial

Rationalist efforts to seek a new theoretical basis for modern architecture revolved around

contemporaneous experiments in modern avant-garde art.' 'We keenly felt the need to begin

the search for a new architecture, to join with the widespread movement of revolutionary

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[59] Vronskaya, *The productive unconscious: architecture, experimental psychology and the techniques of subjectivity in Soviet Russia, 1919-1935*, p. 61
[60] Senkevitch, '*Aspects of Spatial Form and Perceptual Psychology in the Doctrine of the Rationalist Movement in Soviet Architecture in the 1920's*', p. 105
[61] Khan-Magomedov, *Pioneers of Soviet architecture: the search for new solutions in the 1920s and 1930s*, p. 107

minded workers in the arts.' Krinskii recalls, 'In 1919 we merged with the left circle of artists.'[62]

The term 'left circle' of art or artists is a general designation used in the twenties as well as in

later Soviet studies of this period to refer to those avant-garde artists who began immediately

after the Revolution to reject all previous art forms in an attempt to create a purely Socialist or

proletarian art.[63] Senkevitch stated, 'Dokuchaev recognised this aspect of its achievements

when he observed that Cubism was the first to indicate the simultaneous existence of

subjective, psychic, and objective responses to artistic form, thereby providing a scientific basis

for ascertaining its emotional content.'[64] The influence of Kazimir Malevich (1878–1935),

through his Suprematists, became relevant to the development of Space through the

Rationalist Doctrine. Adding to this, Senkevitch stated, 'By Dokuchaev's own admission, he and

his two colleagues likewise investigated the formal means of expression formulated in the

Suprematism of Malevich, concentrating on the implications of the Suprematist rendering of

spatial form. In his initial two-dimensional Suprematism, Malevich negated the naturalistic art

object by reducing painting to geometric symbols and pure feeling.'[65] Malevich's art helped the

Rationalists appreciate the perceptual power of simple unembellished forms in expressive

dynamic compositions that evoke a concomitant sense of Space.

There is perhaps an even more common connection between the Rationalist attitudes to

spatial form by another member of UNOVIS – El (Lazar) Markovich Lissitzkii (1890–1941) and

his so-called 'Prouns,' ('pro-oon'1919 and 1927). 'Proun' is the acronym devised by Lissitzkii

from *PROekt Utverzhdsniia Novogo* [Project for Affirming the New]. Lissitzkii became a

proponent member of the ASNOVA group in the mid-1920s, exposing the overlap of influence

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[62] Senkevitch, *Trends in Soviet Architectural Thought, 1917-1932 The Growth and Decline of Constructivism and Rationalist Movement*, pp. 308-309
[63] Senkevitch, *Trends in Soviet Architectural Thought, 1917-1932 The Growth and Decline of Constructivism and Rationalist Movement*, p. 309, footnote 8
[64] Dokuchaev, V, N. (1929), *Korbiuz'e-Son'e* [Corbusier- Sonniet], Iskusstvo, no. 3-4, p. 130 as quoted in Senkevitch, *Trends in Soviet Architectural Thought, 1917-1932 The Growth and Decline of Constructivism and Rationalist Movement*, p. 312
[65] Ibid., p. 313

over Rationalist Space. Lissitzkii's article 'Proun', published in De Stijl in 1922, asserted that 'Proun' 'advances towards the construction of Space, divides it by the elements of all dimension, and constructs a new many-sided, however, unified image of our nature.' A common thread of innovative Space representation thus runs through the achievements of Cubism and especially Suprematism and 'Prouns', which have special relevance for the Rationalist approach to architectural Space.

The initial thrust of Ladovskii's experiments in development seen during this period, which was influenced by Cubism, Suprematism and Prouns, was at Sinskul'ptarkh/Zhivskul'ptarkh [Collective of the painting-sculpture-architectural synthesis] (1918–1919) exploring the combination of space and volume as the content of the new architecture, which was the first association of the new architects opposed to classicism. It was founded in order to establish a permanent basis for a new contemporary architecture in the synthesis of the three visual arts, which resulted in experiments with colour, form and expressionist architectural fantasies.[66] The Zhivskul'ptarkh experimental designs tended to concentrate less on the articulation of volume than on the manipulation of planes as the principal element for constructing Space. It was undoubtedly here that Ladovskii, along with his associates, first crystallised their conception of architectural form, not as a closed, monolithic volume, but as a dynamic series of layered, interpenetrating planes. A project at Zhivskul'ptarkh by Krinskii (Temple for the Congregation of Peoples, 1919) showed unmistakable traces of Cubist influence in rendering what is still essentially a two-dimensional composition of an apparent three-dimensional form. Ladovskii presented his visualisation of the type 'Architectural manifestation of a communal house

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[66] See Khan-Magomedov, S. O. (1993), *Zhivskul'ptarkh, 1919-1920: pervaia tvorcheskaia organizatsiia sovetskogo arkhitekturnogo avangarda* [the First Innovative Creative Organization in Soviet Architecture Sinskul'ptarkh-(Zhivskul'ptarkh], Moskva: Architectura

1920', conceptual search kindred to Lissitzkii's *Prouns* of the same period.[67] Attached to one of

Ladovskii's drawings was a handwritten note stating his personal credo:

'Technology creates wonders? Architecture also must create wonders. The wonders of
antiquity were built with slave labour and the main factor was the quantity of labour. The
space where temporary wonders of architecture would dwell would be built by art and
intelligence and the main factor would be the quantity of intelligence. Space, not stone is the
material of architecture; sculptural form in architecture must serve its spaciousness. Painting in
architecture must serve first the spaciousness and then the sculptural form. In such
subordination do I accept their synthesis in architecture?'[68]

The collaborative ventures of the development of Ladovskii and his associates' Space

proceeded, in the summer of 1919, from Zhivskul'ptarkh to the 'Group of objective analysis'

(*Gruppa ob'ektivnogo analiza*) in 1920, followed by INKhUK later in the same year.[69] Having

seen above the conceptual proposals by Ladovskii and Krinskii, INKhUK provided the necessary

setting for these ideas developed to be channelled towards a form of architectural pedagogy.

The principal goal of INKhUK was to systematise the emerging modern movement into a

scientifically-based program, known as the 'objective method,' which could be used for

educational and research purposes. The statement of INKhUK was the first programmatic

document to formulate in a general way such fundamental creative principles of Rationalism as

the heightened relationship with the problems of psychology and perception.[70] Ladovskii aimed

at a theory of architecture during INKhUK that required simultaneous research in three

directions: (1) The collection of existing theories of architecture; (2) The adjustment of

theoretical research pertinent to architecture from other disciplines; (3) The explanation of the

group's own theoretical insights into architecture. The first concerned the past, 'what was

achieved'; the second, the present, 'what is achieved now'; and the third, the future, 'what

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[67] Milka, B. (1980), 'Nikolai Ladovskii: The search for a Rational Science of Architecture', *The Soviet and Post-Soviet Review*, 7 (1), p. 174
[68] Ibid
[69] Senkevitch, *Trends in Soviet Architectural Thought, 1917-1932 The Growth and Decline of Constructivism and Rationalist Movement.* U.S, p. 307
[70] Khan-Magomedov, S. O. (1994), *U istokov formirovaniia ASNOVA i OSA : dve arkhitekturnye gruppy INKhUKa* [ASNOVA OSA and groups INKhUK], Moskva: Architectura, p. 175

must be achieved as a theoretical basis for architecture'.[71] The core curriculum was developed

by the leaders of Soviet Avant-Garde – progressive artists and architects who saw design

education, not only as a process of knowledge transfer, but as a vehicle for innovation and a

laboratory for the development of modernist language. The INKhUK and future VKhUTEMAS

conglomerate formed special research 'laboratories' within the school's departments for

exploring the objective method and developing the 'elements' of their respective disciplines –

Painting, Sculpture and Architecture. The school's 'objective method' aimed to provide for all,

creating a unified pedagogical approach across different fields – from painting to architecture.

The method relied on the newest scientific discoveries and technological achievements and on

the most progressive artistic trends. The development of Space theory through INKhUK

provided the necessary means to be introduced into a form of architectural learning providing

the necessary ground work to become established as an architectural curriculum within

VKhUTEMAS.

1.5 Approach to Space Pedagogy: OBMAS (*Ob'edinennye 'levye' masterskie United Leftist Studios* 1921-1923)

As has been shown, vital groundwork had been laid in the important artistic experiments at

Zhivskul'ptarkh and the theoretical formulations at INKhUK. According to Khan-Magomedov,

'after appraising the situation in the architecture department, Ladovskii suggested to his

colleagues a different plan: creation of OBMAS to enable the three professors to attain

autonomy within the [framework] of the architecture department and thus define, themselves,

the program of instruction.'[72] OBMAS started off in a small office within VKhUTEMAS, where

the rationalists were preparing the methodology for a new form of architectural teaching. This

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[71] Bliznakov, '*Nikolai Ladovskii: The search for a Rational Science of Architecture*', p. 177

[72] Khan-Magomedov, *Psikhoanaliticheskiĭ metod N. Ladovskogo vo VKHUTEMASE-VKHUTEINE: ob"edinennye levye masterskie; psikhoanaliticheskaia laboratoriia*, p. 190

move shielded the Rationalists from any external influence and provided the necessary

pedagogical setting to develop freely a new form of spatial teaching. The framework for an

active pedagogy program, demanding rigorous application and continual adjustment during

OBMAS, supplied the ultimate arena for testing and refining both individual tenets and the

doctrine as a whole.[73] Here, the basic Rationalist concepts of dynamic spatial form were

applied, tested, and refined within the exacting framework of a comprehensive program

incorporating the new principles and methods of architectural design. The pedagogical

framework of OBMAS can be broken down into four categories: (1) a new formation of

pedagogy to the architect, (2) the development of one of the most interesting and elaborate

inter-faculty propaedeutic courses – Discipline Space, (3) the creative concept formation of

Rationalism, and (4) the techniques and tools of expressive artistic composition to be used in a

new style of teaching – that being Rationalism.[74] In her dissertation, Vronskaya states, 'This

foundation could leave no place for artistic individualism; rather, it had to be based on the

latest scientific achievements and respond to the modern lifestyle. The motto 'Space, not

stone, is the material of architecture,' which Ladovskii articulated at VKhUTEMAS, summarising

his project for a new architectural method, offered just such a foundation. It was a product of a

cutting-edge, dynamic and complex science-psychophysiology.[75] The student had to be

prepared for the possibility of capturing the observer's imagination through his awareness of

space by creating sufficient perceptual clues for measuring and detecting key spatial

relationships.[76] The role of OBMAS was immeasurably greater towards the creation of a new

form of architectural teaching. It was a creative studio developed in VKhUTEMAS for the

[73] Senkevitch, '*Aspects of Spatial Form and Perceptual Psychology in the Doctrine of the Rationalist Movement in Soviet Architecture in the 1920's*', p. 94

[74] Khan-Magomedov, *Psikhoanaliticheskiĭ metod N. Ladovskogo vo VKHUTEMASE-VKHUTEINE: ob"edinennye levye masterskie; psikhoanaliticheskaia laboratoriia*, p. 190

[75] Vronskaya, *The productive unconscious: architecture, experimental psychology and the techniques of subjectivity in Soviet Russia, 1919-1935*, p. 59

[76] Senkevitch, '*Aspects of Spatial Form and Perceptual Psychology in the Doctrine of the Rationalist Movement in Soviet Architecture in the 1920's*', p. 102

purpose of developing a new style of architectural teaching. The number of students enrolled

at OBMAS remained small as the teaching and development of Space theory remained in its

testing stages. During the teaching of OBMAS, in his article, *N A Ladovskii 1881–1941*, Khan-

Magomedov stated, 'Ladovskii encouraged his students to work as individuals, using their

intuition; he considered it important that they should develop a sense of 'fantasy,' and

'stimulated' their imagination by showing them how to organise Space in three dimensions.'[77]

1.6 The Psycho-analytical Method within the pedagogy of Space Teaching

Within the pedagogical opportunities and constraints operating in VKhUTEMAS within OBMAS,

Ladovskii and the Rationalists defined the theoretical and methodological content of their

doctrine. Khan-Magomedov stated, 'By 1920, when Ladovskii was engaged in the reform of

artistic aspects of the curriculum in the Architectural Faculty of VKhUTEMAS, Ladovskii had

already worked out a new, so-called 'psycho-analytical' method of teaching. He put forward a

new system of teaching, teaching architectural composition, devising compositional tasks for

the construction of large spatial forms, and introducing the practice of making students

prepare models for their compositional exercises.'[78] In his book *Creative flow concept and*

organisation of the Soviet avant-garde, *OBMAS VKhUTEMAS,* Khan-Magomedov comments,

'Ladovskii had already developed his views on the role of perception and space in architecture

before joining VKhUTEMAS, he found himself faced with the necessity not only of

communicating these ideas to students in a systematic format in 1921, but also of beginning

the professional education of these students in such a way that the conception of form-shaping

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[77] Khan-Magomedov, S. O. (1970), 'N A Ladovskii 1881-1941', *Journal of Architectural Design*, 40 (2), p. 86
[78] Khan-Magomedov, *Pioneers of Soviet architecture: the search for new solutions in the 1920s and 1930s*, p. 107

would become the basis of their professional credo.'[79] The development of rationalist Space

created a method of theory and pedagogy for teaching. According to Khan-Magomedov:

> 'The psycho-analytic method of teaching which Ladovskii had worked out sought to develop in
> the student, from the first day of entry into architectural school, the necessary volumetric-
> spatial mode of thought. The program was therefore constructed in such a way as to provide
> for a gradual increase not only in difficulty of 'abstract' problems in spatial forms, in the
> surrounding environment of the form and points of view directed at the form, but also in the
> student "production" tasks, which united artistic-compositional and functional constructive
> demands.'[80]

According to Senkevitch, 'The method not only encompassed the Rationalists' comprehensive

program for teaching design, but elucidated the core of their architectural theory as well.'

Senkevitch argued that Dokuchaev, not Ladovskii, underscored the essentially Cartesian nature

of the rationalist approach to architectural instruction during OBMAS, 'Practically speaking, this

method provides that the student begin his study of architecture by acquiring incremental

knowledge of the principles and laws of composition, and of [the means of] architectural

construction.'[81]

The psycho-analytic method of teaching that Ladovskii sought to develop in the student from

the first day of entry into architectural school, was the necessary volumetric-spatial mode of

thought. While the psycho-analytical methods used as a design tool for generating form, by

developing a process of pedagogy without precedent, Space focussed more on the perception

of the solution. Ladovskii agreed that the compositional structure of Space is vital for becoming

a complete architect. Therefore Space, carrying the commonalities of both theory and

pedagogy, became a widely-accepted design tool aiming to acknowledge future developments

and achieve better architecture. Students were educated in what Hildebrand called

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[79] Ibid., p. 191

[80] Khan-Magomedov, *Psikhoanaliticheskiĭ metod N. Ladovskogo vo VKHUTEMASE-VKHUTEINE: ob"edinennye levye masterskie; psikhoanaliticheskaia laboratoriia*, p. 194

[81] Senkevitch, '*Aspects of Spatial Form and Perceptual Psychology in the Doctrine of the Rationalist Movement in Soviet Architecture in the 1920's*', p. 93

Kunstlerische sehen; namely, the refining of their sensitivity to (1) the vision of spatial forms, (2) the relationship between form and its context, and (3) the relationship between form and its viewpoints. 'These three conditions' – explains Dokuchaev in the widely-read pamphlet *Arkhitektura VKhUTEMAS* (1927) – 'are the basic factors determining the main compositional tasks in each building.'[82] The method of pedagogy would be taught through three different perspectives to allow the teaching to be delivered through a new perspective.

1.6.1 Process

The original plan developed by the Rationalists was to create a new 'process' of teaching, with Ladovskii at its head and Dokuchaev and Krinskii as his assistants as a form of pedagogical delivery (Table 1.1). Here, under the leadership of Ladovskii and his co-workers, using the creative potential of youth in the course of educational projects, occurred the process of elucidating the professional language of the new architecture.'[83] As stated by Senkevitch, 'Although Dokuchaev and Krinskii proved instrumental in helping consolidate the Rationalist position at the VKhUTEMAS, it was Ladovskii who developed the new methodology for architectural composition and design that was to prove the cornerstone of the Rationalist doctrine.'[84] The majority of the architecture faculty's instructors at VKhUTEMAS adhered to traditional methods of pedagogy. This placed Ladovskii in a difficult position, since a general faculty committee for each academic subject defined the methods of pedagogy. Khan-Magomedov explains, 'it is this latter condition in particular that makes the legacy of OBMAS

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[82] Dokuchaev, *Arhitektura Vchutemasa*, viii, as quoted in Leach, A. and Macarthur, J. (2015), *The Baroque in Architectural Culture, 1880-1980*. See Luka Skansi, Chapter 4, '*The "Restless Allure" of (Architectural) Form: Space and Perception between Germany, Russia and the Soviet Union*', p. 52

[83] Khan-Magomedov, *Psikhoanaliticheskiĭ metod N. Ladovskogo vo VKHUTEMASE-VKHUTEINE: ob"edinennye levye masterskie; psikhoanaliticheskaia laboratoriia*, p. 191

[84] Senkevitch, *Trends in Soviet Architectural Thought, 1917-1932 The Growth and Decline of Constructivism and Rationalist Movement*, p. 330

so extraordinally valuable; its role far exceeded the [method] for developing a new form of

education.

Ladovskii's Process of Teaching (1921–1923)
Abstract
Stage 1. Assignment Issued
Stage 2. Explanation of task
Stage 3. Drawing (Abstract tasks)
Stage 4. Evaluation
Production
Stage 5. Assignment Issued
Stage 6. Explanation of task
Stage 7. Drawing/Model (Production tasks)
Stage 8. Evaluation
Stage 9. Advance to next Abstract task

Table. 1.1. Ladovskii's Process of teaching 1921-1923, consisted of 9 stages of pedagogy split between both 'abstract' and 'production'. The table depicts the nine stages pieced together from numerous literature sources: (Khan-Magomedov, 2007), (Khan-Magomedov, 1993), (Khan-Magomedov, 2007), (Khan-Magomedov, 2011). Each publication offered 'snippets' of pedagogical facts allowing the author to present the findings in a sequential manner. Table constructed by author

At the beginning of Ladovskii's process, Ladovskii discussed and issued his newly-developed

assignment with students (stage 1). Having issuing the assignments, Ladovskii then explain the

task (stage 2) after which the task would be drawn or modelled (stage 3). The inclusion of the

model would only be applicable to 'production' tasks, where the model was more fruitfully

used to perceive Space, as opposed to 'abstract' tasks. At this stage, the modelling was not

fully developed as a pedagogical tool to create Space. The final stage would consist of an

evaluation of the task constructed (stage 4), completing the short approach to the first

category (abstract) of the process of teaching. The 'process' would be repeated through

'production' tasks to meet the requirements set by Ladovskii. The process would set the

approach to how two other areas of teaching would be taught within the developed process.

1.6.2 Sequence

The 'sequence' which became the second area of Ladovskii's teaching consisted of a new form of issuing architectural instruction through assignment drawings. The new format of instruction became the founding sequence that defined how Space would come to be taught and understood by the students. Ladovskii used a set of prescribed operations, very basic step-by-step written instructions. Ladovskii's assignments were designed in such a way that the students would acquire the correct spatial knowledge to become architects. Ladovskii's assignments followed the distinction between revelation and expression, putting a particular emphasis on the former. Khan-Magomedov explains, 'The work set on each theme consisted of a twofold "sequence", a first "abstract" part, in the form of compositional tasks, the second, 'production'– the solution of the same compositional problems, but as part of the design of an actual object.'[85] Situated at the core of the architectural work, revealing Space through either drawing or modelling became the major task of Rationalist pedagogical assignments, while composition was interpreted as the key architectural method.[86] Assignments designed by Ladovskii were given in written form, containing six basic requirements and consisting of the following: (1) The teacher provides: a) a shape and its size; b) the conditions in which it is located: the situation in relation to the viewer and the Space coordinates, and also the lighting conditions; (2) students are required to answer a number of questions about the discipline (particular questions are listed); (3) problem-solving tools (listed); (4) Method of solution – the principles and types of possible solutions should be indicated; (5) Scale of the model; (6) Term of assignment completion (deadline).[87] The assignment drawings were classified according to

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[85] Khan-Magomedov, *Pioneers of Soviet architecture: the search for new solutions in the 1920s and 1930s*, p. 108

[86] Vronskaya, *The productive unconscious: architecture, experimental psychology and the techniques of subjectivity in Soviet Russia, 1919-1935*, p. 110

[87] Khan-Magomedov, *Ratsionalizm* [Ratio-arkhitektura] *'Formlalizm'* [Rationalism (Ratio-architecture) 'Formalism'], p. 263, translation by author, Russian original: Задания даются в письменном виде и имеют следующее содержание. 1) Дается: а)

three different parameters: the genre of expression ('abstract' or architectural), the artistic

task (formal expressivity or the revealing of form), and finally, the formal quality to be

expressed (geometrical, physical, mechanical, or spatial properties). In the context of 'abstract'

and 'production' tasks and within the method of the psycho-analytic method, students worked

on the following tasks, which would be repeated one after the other in close proximity (Table

1.2). Regardless of actual content, the tasks Ladovskii set his students radically changed their

attitude to project work and kept them in a state of creative tension throughout the process of

design.[88] He knew how to draw out the very best in his students by setting them 'abstract' and

'production' problems that demanded use of all the potential and talent at their disposal.[89] His

students have vivid memories of the brain-teasers he set, which nagged at them again and

again; they went over the countless possible solutions.[90] In her thesis, Vronskaya states,

'Student assignments at OBMAS were aimed at analysing the laws of the psychological

formation of space and at mastering the art of constructing coherent spatial perception.'[91]

Further stated by Vronskaya, 'Academic projects were not judged solely on the merits of a last

iteration, but as a collection of false starts or stabs at solving a problem; Ladovskii's pedagogy

methodically moving from elementary to more complex architectural tasks, following the

Rationalist vision of architecture as a system of subjectively perceived forms and psychological

rules.'[92] According to Khan-Magomedov, 'One of the features peculiar to this system was its

insistence on problem-solving. Ladovskii did not cram his pupils, or needlessly intervene in the

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форма и ее размеры и б) условия, в которых она находится: положение в отношении к зрителю и к пространственным координатам и условиям освещения. 2) Требуется: ответить на ряд задач по данной дисциплине (перечисляются конкретно). 3) Средства решения задач (перечисляются). 4) Метод решения-указание принципов и видов возможных решений. 5) Масштаб макета. 6) Срок окончания задания. Задания предварительно утверждаются предметной комиссией
[88] Ibid
[89] Ibid
[90] Ibid
[91] Vronskaya, *The productive unconscious: architecture, experimental psychology and the techniques of subjectivity in Soviet Russia, 1919-1935*, p. 111
[92] Ibid

details of their design work, but invariably added some extremely complicated problem – or even a conundrum – to each set of abstract and production tasks.'[93]

Abstract Tasks	Production Tasks
1. Revelation of the geometric attributes of form	**2.** Revelation of the geometric attributes of form
3. Revelation of the physical-mechanical attributes of form – Mass and Stability, Mass and Balance	**4.** Revelation of the physical-mechanical attributes of form – Mass and Stability, Mass and Balance
5. Revelation and expression of Mass and Weight	**6.** Revelation and expression of Mass and weight
7. Revelation of Construction	**8.** Revelation of Construction
9. Revelation of Space	**10.** Revelation of Space
11. Revelation of Dynamics, Rhythm, Relationships and Proportions – on a Plane	**12.** Revelation of Dynamics, Rhythm, Relationships and Proportions – on a Plane
13. Revelation of Dynamics, Rhythm, Relationships and Proportions – on a Vertical Axis	**14.** Revelation of Dynamics, Rhythm, Relationships and Proportions – on a Vertical Axis

Table. 1.2. Ladovskii's 14 tasks portraying the sequence of tasks designed for the student to learn the correct elements of Space Source: (Khan-Magomedov, 1993, p. 63). Table constructed by author

Similar to Ladovskii's 'process' of teaching (Table 1.2) the devised 'sequence' worked in conjunction with the approved tasks, allowing firstly 'abstract' tasks to be taught, then 'production', repeating each 7 times and allowing the students to complete the learning of Space. As outlined by Khan-Magomedov, 'This sequential execution of two assignments on one theme allowed students to understand the sense of the "abstract" tasks and the difference in approaches to studying the "abstract" and then "production" tasks'[94] The assignments depicted an architectural problem in an elementary format and held Ladovskii theory in just a single page, making the assignment format through the sequence of issue crucial for the way in which the next stage of pedagogy was to be carried out.

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[93] Khan-Magomedov, *Pioneers of Soviet architecture: the search for new solutions in the 1920s and 1930s*, p. 108
[94] Khan-Magomedov, *Psikhoanaliticheskiĭ metod N. Ladovskogo vo VKHUTEMASE-VKHUTEINE: ob"edinennye levye masterskie; psikhoanaliticheskaia laboratoriia*, p. 194

1.6.3 Model–Format

As a means to teach Space as a process and distribute the 'sequence' of assignment drawings required a choice of medium to be used to construct Space. Khan-Magomedov stated, 'Students in other architectural workshops dealt only with paper, drawing tools, pencils, ink, and paints. In OBMAS, the students sketched in clay, creating a different image. Many former students of VKhUTEMAS told me in conversations that they walked around, smeared with clay and were clearly disciples of Ladovskii. The work (prior to the abstract tasks) proceeded in the following order: preliminary sketches on paper, then the basic work in clay (using cardboard, paper, etc.) and, finally, the completed version of the layout was measured and plans drawn on paper. Some abstract tasks (for example, on space) were made only in the layout; they did not make any drawings of them.'[95] Unlike drawing, use of the model would allow faults and weaknesses, not revealed on paper, to be instantly apparent. The model could then be studied and altered by adding or removing pieces as desired, until the best solution for the problem was found, providing a 'manipulation of Space.' Ladovskii believed that the future architect must learn to think in a three-dimensional composition, sketching, not on paper, but in volume, before transferring the plan to paper.'[96] The accounts by Khan-Magomedov – expose the different approaches to Space construction and the difference in scholarly understanding about the role of medium used at OBMAS – is quite revealing through contrasting accounts, causing the medium of construction to remain mis understood. Between drawing and modelling, graphical evidence reveal the drawing remained more applicable in the context of 'abstract' tasks with the model more readily used through 'production' tasks.

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[95] Khan-Magomedov, *Ratsionalizm* [Ratio-arkhitektura] *'Formlalizm'* [Rationalism (Ratio-architecture) 'Formalism'], p. 146
[96] Ibid

1.6.4 Expressive Qualities to Perceive Architecture

Ladovskii's teaching further proceeded from the basic assumption that there were expressive perceptual qualities inherent in architectural form that, if consciously exploited by the designer, would facilitate the observer's comprehension of, and orientation to, the built environment in spatial terms (Table 1.3).[97]

The rational solution to an architectural problem, according to Ladovskii's theory, is predicated upon the articulation of Space-form through the rational use of 'architectural motifs', or visual entities, which would enable the observer to measure the shape and impact of the architectural form and thereby orient himself to his physical surroundings. The formal manipulations that Ladovskii advanced in his last category of Expressive Qualities were aimed at providing just such clues.[98] As explained further by Senkevitch, 'These visual symbols, or metaphors, would both enable the designer to determine the shape and impact of the architectural form and allow the observer to apprehend and measure the effects of that impact and thus orient himself to his physical surroundings.'[99] Stated by Ladovskii:

> 'Architecture operates by means of properties – like weight, density, mass, finiteness and non-finiteness, stability or dynamics etc. – in specific quantities. The architect constructs a form, bringing together elements that are not technical or utilitarian ones in the normal sense of those words, but which can be looked upon as 'architectural motifs'. In the architectural respect these 'motifs' must be rational, and must serve the higher technical demand of the individual to orientate himself in space.'[100]

According to Dokuchaev, 'Ladovskii's method provided students and architects alike with highly reliable means for solving architectural problems by making it possible to illuminate the degree

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[97] Senkevitch, '*Aspects of Spatial Form and Perceptual Psychology in the Doctrine of the Rationalist Movement in Soviet Architecture in the 1920's*', p. 94

[98] Ibid., p. 102

[99] Ibid., p. 94

[100] Ladovskii, *Osnovy postroenija teorii arhitektury* [Foundations for building a theory of architecture] Proceedings of the Association of New Architects, Izvestiia ASNOVA, p. 3

of measurable impact that a given form can exert upon the observer.'[101] According to Khan-Magomedov, 'Four specific qualities of expressiveness were advanced for the purpose of architectural teaching':

Expressive Qualities
1. Geometrical: Relationship of the sides, edges, angles, characteristics of surface, etc.
2. Physical: weight, density, mass, etc.
3. Physico-mechanical – stability, mobility, etc.
4. Logical: Expressiveness of surfaces, character as such and of delimiting volumes. According to the expressiveness, sizes and quantity we may speak of: A: strength and weakness B: greatness and smallness, C: finiteness and non-finiteness[102]

Table. 1.3. Ladovskii's four Expressive Qualities to be included within each architectural form. Table constructed by author

Ladovskii's four categories of 'Expressive Qualities' operate simultaneously and interactively within any given form and contain 'element-symbols' furthering the separation of qualities (Table 1.3). The first Expressive Quality was 'Geometrical', which made possible the perception of the geometrical properties of form by indicating the relationships of sides, edges, angles and surfaces. The second, or 'physical,' involved the visual effect of an appearance of weight and mass, or the force of gravity, acting on a form that defines the visual manifestations of the force of gravity acting on that form.[103] The third quality, encompassing the 'Physico-mechanical' properties of form, concerned the perception of dynamic states of equilibrium between elements appearing at rest and those appearing in motion within a form perceived through the kinesthetic sensation, which concern its relative stability or movement.[104] Ladovskii's third category of expressive quality, that of the mechanical properties of form

[101] Dokuchaev, *Sovremennaia russkaia arkhitektura i zapadnye paralleli* [Contemporary Russian architecture and its Western parallels] as quotes in Senkevitch, *Trends in Soviet Architectural Thought, 1917-1932 The Growth and Decline of Constructivism and Rationalist Movement*, p. 343

[102] Ladovskii, *Osnovy postroenija teorii arhitektury* [Foundations for building a theory of architecture] Proceedings of the Association of New Architects, Izvestiia ASNOVA, p. 3, translated by author, Russian original: 1) геометрических — отношения сторон, ребер, углов, характер поверхностей и т. д. 2) физических—весомость, плотность, массу, и т. д. 3; физико-механических—устойчивость, подвижность, 4) логических—выразительности поверхности как таковой и ограничивающей об'ем В зависимости от выразительности величины и количества мы можем говорить о: а) мощислабости , б) величиининизменности , в) конечностиибезковечноти

[103] Senkevitch, *Trends in Soviet Architectural Thought, 1917-1932 The Growth and Decline of Constructivism and Rationalist Movement*, p. 340

[104] Ibid

(motion, rest, equilibrium), were aimed at amplifying the range of formal means for articulating form by energising its apparent structure – what Dokuchaev referred to as architectural, as distinguished from technical, construction.[105] The fourth quality, which Ladovskii termed the 'logical', focussed on perceiving the significance of surface, or plane, both as a formal element in its own right, and as a device marking the boundaries of a volume.[106] Through Ladovskii's four Expressive Qualities each solution represented one step along a path or sequence that led to the making of a complex three-dimensional form that would lead to a sequence of tasks being formed. Although each category was isolated for purposes of analysis, its effect on architectural form was both interactive and cumulative, obtained through a sequence of carefully orchestrated impressions of one 'motif' and then another, each superimposed on the last.[107] The outcome of new forms of teaching was to be a new architecture for the Soviet Union, and this process would do just that by providing a simple and coherent form of pedagogy. It is unclear whether Ladovskii's intentions at this stage held a mass element of pedagogy in mind or were solely for the purpose of developing his new theory with a select number of students.

1.7 Summary of Chapter

This chapter has reviewed the approaches and methods of Ladovskii's psycho-analytical theory and pedagogy. The first section looked at the definition of Space, providing definitions by the three main teachers. The chapter was then followed by defining the term Rationalism, which remained central to the development of Space theory and teaching. The scope and approach to Rationalist Space theory through the arts, through the conceptual beginnings of Ladovskii's

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[105] Senkevitch, '*Aspects of Spatial Form and Perceptual Psychology in the Doctrine of the Rationalist Movement in Soviet Architecture in the 1920's*', p. 99
[106] Ibid., p. 94
[107] Ibid

theory, and through the likes of Cubism, Suprematism, Prouns, remained central to the

development of Rationalist Space theory and pedagogy through both Sinskul'ptarkh and

Zhivskul'ptarkh. The continuation of the development of theory can be seen to have had a

central role in the discussions and development during INKhUK. The chapter next addressed

the approach to space pedagogy through the newly-formed OBMAS towards forming a new

form of architectural learning. The pedagogical focus of Ladovskii's teaching remained on the

three areas of teaching identified by Khan-Magomedov, process, sequence and model-format.

The process provided the necessary means to teach the new approach to architectural

learning. The sequence of tasks making it possible for the pedagogy to be delivered is well

placed within the debate, as the level of understanding of Ladovskii's 'Expressive Qualities' for

perceiving architecture is strong, exposing the inner workings of theory within Ladovskii's

teaching. The notion of which medium became the primary entry into Space remained limited,

based on weak understandings. The above context has exposed the depth of the rationalists'

pedagogy up to 1923 and will remain of importance for understanding and comparing within

the research findings relating to Discipline Space teaching which will be compared in chapter 6.

Chapter II

Discipline Space (1923–1926)

2.1 Introduction

The previous chapter clarified that in the wide range of literature, Ladovskii's theory and pedagogy has been advocated as a useful design tool when seeking solutions to achieve a better quality of architecture. Unlike previous research, this thesis aims to use the theory and pedagogy of Ladovskii (1921–1923) to investigate the impact of continuity and discontinuity during the pedagogy of Discipline Space (1923–1926) to expose how it became taught. The chapter now reviews the literature of Discipline Space between 1923–1926. It has three main aims: to introduce Discipline Space as a Discipline closely associated with Ladovskii's theory/pedagogy; to explain why the scope of research was narrowed down to the study of Discipline Space; and to review the literature on Discipline Space and its association with Ladovskii's theory/pedagogy in order to expose the gaps between both settings. The chapter covers five areas: (1) defining Discipline Space, (2) scope and approaches to studying Discipline Space, (3) gaps in discipline space research – studying its pedagogy, (4) gaps between Ladovskii's theory/pedagogy (1921–1923) and Discipline Space (1923–1926), and (5) potential links to be established. The approach of the review is intended to highlight the gaps to further the debate to provide a first-hand account of how Discipline Space is taught.

2.2 Defining Discipline Space

In 1923 an autonomous basic division was established within the structure of VKhUTEMAS. It needed to supply the teaching staff for the propaedeutic (preliminary) course Space, a subject created with the 'intention' of the psycho-analytic method at its base. Discipline Space, a term portrayed through different definitions by different scholars such as Khan-Magomedov (2007), can be defined as a discipline orientated towards an elementary form of architectural teaching. Developed by Ladovskii, Krinskii and Dokuchaev as a foundational architecture course, Space was paramount, not only for its innovative teaching, but also as an experimental workshop for developing a new architectural language. According to Lodder, the Space *Kontsentre*, 'Aimed to give a formal basis to the spatial arts (to architecture and to those productions, decorative and fine arts concerned with it) to develop a perception of spatial forms, and to provide the fundamental compositional skills for their organisation.'[108] Discipline Space refers to different stages of the preliminary teaching of architecture, developing and training many students in the fundamentals of modern architecture. A further definition is provided by Khan-Magomedov, 'The necessity for the creation of a Discipline solely focussed on architectural teaching during the preliminary stages of architectural education was to become apparent.'[109] Given this definition, Discipline Space became highly influential, not only for its innovative pedagogy, but also as a revolutionary setting for the development of new architectural learning.

Discipline Space became the entry into architectural learning at VKhUTEMAS in 1923, with architectural propaedeutic as a 'starting point' or an introduction to the subject or for study for the entire learning path of students. The architectural propaedeutic course program reflected

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[108]'*Doklad predsedatelya prostranstvennogo kontsentra professor Krinskogo'*, 1926, TsGALI, fond 681, op. 2, ed. Khr. 65, list 134 as quoted in Lodder, *Russian Constructivism*, p. 128
[109] See Khan-Magomedov, *Ratsionalizm* [Ratio-arkhitektura] *'Formlalizm'* [Rationalism (Ratio-architecture) 'Formalism']

not only the time to which it belonged, but the general thrust of searches in designing object-spatial environment. In contrast to the development of theory and pedagogy seen at OBMAS, Discipline Space now became a true architectural discipline with individual status within the setting of the Basic Preliminary Course. It remained prominent within the setting of VKhUTEMAS and VKhUTEIN, lasting for 7 years (1923–1930). Describing the course, Khan-Magomedov explains, 'The Basic Course operated from 1923 to 1926 as an autonomous discipline. Students attended a two-year preparatory course. The section included a third of all VKhUTEMAS students.'[110] Outlined by Bokov (2014), 'in the 1924–1925 academic year, VKhUTEMAS had 1445 Students.[111] According to Khan-Magomedov, 'In the autumn of 1926, the period of study in the main department was reduced from two years to one year, which forced teachers from Discipline Space to rebuild the program with a focus on the first year as part of the main department, and the second year as part of the Faculty of Architecture (2nd course).'[112] The parameters of this research, focussing solely on Discipline Space, will include the period of the first section (VKhUTEMAS, 1923–1926) of the Basic Preliminary Course and not VKhUTEIN 1926–1930.

2.3 Scope and Approaches to Studying Discipline Space

As the research is focused on a Soviet topic with most literature written in Russian, it is the author's intention to translate the appropriate literature to source the research gaps. The following section will review conceptual/theoretical and historical studies to identify the determinants of Discipline Space with reference to three early publications by the teachers of Discipline Space: Dokuchaev, Krinskii, Lamtsov and Turkus, and three contemporary scholars,

[110] Khan-Magomedov, *Ratsionalizm* [Ratio-arkhitektura] *'Formlalizm'* [Rationalism (Ratio-architecture) 'Formalism'], p. 263
[111] Bokov, A, (2014), '*VKhUTEMAS Training',* excerpt from Fairenough magazine Russian Pavilion Venice Biennale, p. 102
[112] Khan-Magomedov, *Ratsionalizm* [Ratio-arkhitektura] *'Formlalizm'* [Rationalism (Ratio-architecture) 'Formalism'], p. 264, translation by author, Russian original: отделении был сокращен с двух лет до одного года. Это заставило преподавателей дисциплины Пространство перестроить программу с ориентацией на первый год в составе Основного отделения и на второй год - в составе Архитектурного факультета

Lodder, Khan-Magomedov and Skansi, between the years 1927–2015. There is only a limited amount of literature in existence, with the most prominent scholar being Khan-Magomedov (1928–2011), and he will be the primary focus for the review.

The understanding of Discipline Space has been historically grounded on Khan-Magomedov's claims. As will be seen, the lack of focussed scholarship on Discipline Space teaching has caused the period to be portrayed as fragmented, and due to its complexity, overlapping areas of understanding, both in its literature and its lack of relationship to archival material.

The first publication on Discipline Space (Dokuchaev, 1927, pp. 6–9) contained a brief description of course program and a select number of photographs pertaining to Space teaching, outlining 4 tasks that were part of the pedagogical programme of Discipline Space. Based on a brief from the program outlined in the book published in *Arkhitekturnyi fakul 'tet VKhUTEMASa* [Architecture Department of VKhUTEMAS], *Arkhitektura Raboty arkhitekturnogo fakul'teta VKhUTEMAS* [Architecture Works of Architecture Department of VKhUTEMAS], Dokuchaev explains, 'The first task is to build an expressive flat surface as a simple type of surface. The surface can be described as a shape perceived by the viewer in two dimensions. According to the task conditions, the plane should be located frontally to the viewer, have a minimal thickness; its environment is not taken into account. These conditions determine the character of composition as most static and closed. The second task is to build expressive volume. This task is a more complex form of the conditions given in the first task. The volume can be described as a three-dimensional shape, perceived by the viewer through movement around the vertical axis of the volume and motor-tactile perception of its shape. These conditions make it necessary to consider the elements of volume, not as isolated from each other, but built in cooperation and subordination in a closed system with a visual motor system

and movement around the volume as a main side, which is the compositional centre of the whole system. The third task is to construct expression of the 'Mass and Weight' of volume. The main compositional task is to express the interaction of a given volume as the active force (gravity) and the base as a counter support. The weight is considered the main active force, which generates the impression of shape weight, and is the primary means of solving the problems of given compositional task. The fourth task is to build an expressive shape of limited space and its expression, which is located in this space.'[113] Such account provides relevant understanding of the programme taught and tasks to be constructed by the students. The early account is limited in providing a detailed discussion of the subjects teaching beyond the programme and tasks.

In 1934, four years after VKhUTEIN closed Ladovskii's colleagues and former students, Krinskii, Turkus and Lamtsov, published their collective research, resulting from over a decade of teaching Discipline Space (Krinskii, Turkus and Lamtsov, 1932). Some years later the book was reproduced in a second edition (1968), as the theory and teaching of Space was maintained at MARKhI (the school became formed after the closure of VKhUTEIN in 1930) but in an alternative fashion, containing the exercises of many students work from VKhUTEMAS. In both books the authors outlined their comprehensive design methodology, grounded in form-finding experiments and precedent analysis, guided by the laws of spatial composition. The book, or rather the textbook, decoded diverse architectural case studies in terms of 'abstract notions', such as rhythm, composition, scale, and proportion – or what were termed 'elements' by the authors.[114] Historical precedents were intermixed with the modernist projects and the student work continued during Discipline Space. At the back of the second book (1968, pp.

[113] Dokuchaev, V. N. (1927), *Arkhitekturnyi fakul 'tet VKhUTEMASa* (Architecture Department of VKhUTEMAS) *Arkhitektura Raboty arkhitekturnogo fakul'teta VKhUTEMAS* [Architecture Works of Architecture Department of VKhUTEMAS]
[114] Krinskii, V. F. and Lamtsov, I. V. with Turkus, M. A. (1934, 1968), *Elementy Arkhitekturno-Prostranstvennoii Kompozitsli* [Elements of Architectural-Spatial Composition], Moskva: Gos Izd

148–157) a selection of model photographs pertaining to tasks on 'Surface', 'Form', 'Mass and Weight', were included, showing, with historical references how student ideas related to the methodology of teaching. The literature remained focussed on the methodology of theory, and less on the pedagogical function of how the methodology was taught. The published students work did not give a complete picture of the place and role of Discipline Space in the general system of artistic training. The literature fails to provide any descriptions or dates for the photographs, causing the material to remain separate from the overall discussion. The literature remains important for advancing the scholarly debate.

Between 1968 and 1983, there appears to have been a lack of focused scholarship on Discipline Space teaching in the Basic Preliminary Course at VKhUTEMAS. The reason for this is unknown. The approach to Discipline Space became re-established (Lodder, 1983) and is an important account within the academic debate, exposing the historical perspective of Discipline Space. According to Lodder, 'the essence of the course consisted of examining the means by which space was defined (e.g., superimposition), and the means by which it could be transformed (methods of expansion, contraction, widening, lengthening, etc.).[115] Through Lodder's work, pedagogical accounts mention 'Four Exercises' that the student of Discipline Space would construct, consisting of 'Surface', 'Expressive Volume', 'Volume Weight and Mass' and 'Expressive Form' for defining Space, as mentioned in Dokuchaev (1927), Krinskii, Lamtsov and Turkus (1968) and exposing a continuation of factual accounts.[116] Lodder continued the historical account by stating that all exercises were required to be presented in three-dimensional models, exposing incomplete understandings of Discipline Space pedagogy and how the students would construct their forms.[117] Lodder's account at that time was the first to

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[115] TsGALI, fond 681, op. 2, ed. Khr. 65, list 134 as quoted in Lodder, *Russian Constructivism*, p. 128
[116] Lodder, *Russian Constructivism*, p. 129
[117] Ibid

address the subject in relative detail and is important in providing historical facts of what the definition of Discipline Space was and how the pedagogy functioned, even if only briefly. Lodder's work included a select number of photographs similar to Dokuchaev (1927) and Krinskii, Turkus and Lamtsov (1968), capturing the tasks constructed by the students, but with a lack of detail and without dates, causing the photographs to remain in isolation. As the focus of Lodder's work was not entirely on the pedagogy of Discipline Space but was positioned within the realm of Russian Constructivism, the factual accounts and relationship to the sourced images remained limited, but were a welcome inclusion in the scholarly debate. A further understanding and development is required at this stage, such as: were all exercises by the students modelled, and how were the students taught?

The first 'serious' literature on Discipline Space, that of Khan-Magomedov (1987), focusses on Ladovskii's movement of Rationalism. The accounts of Discipline Space are fruitfully mentioned and positioned into the wider context of other movements of Constructivism from the same period, provides ground-breaking, scholarly work on the teaching of rationalism, covering many areas, such as (briefly) the 'psycho-analytical' method of teaching. There appears to be a lack of understanding of how Discipline Space teaching from 1923 is taught, apart from a welcomed focus on the alternative setting of the teaching of Ladovskii and one of his associates, Balikhin, during that period through their literature.[118] Continued within his literature Khan-Magomedov stated, 'The transition from theoretical development during OBMAS over its three year period, to the newly-formed curriculum of Discipline Space within the Basic Preliminary Course was seen to have been the result of, not only the architectural theory of Ladovskii's "psycho-analytical" method being taken forward, but more importantly, development of the new method of architectural instruction, to teach many students from

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[118] Khan-Magomedov, *Pioneers of Soviet architecture: the search for new solutions in the 1920s and 1930s*, p. 143

diverse backgrounds, initially taught to a select few by Ladovskii and his associates.'[119] The

term Space or psycho-analytical theory can be seen to have been portrayed across into

Discipline Space without any thorough consideration of whether or not the theory remained

taught the same way. The lack of understanding is quite revealing, creating a clear gap within

the debate. There is very little information on the pedagogical function of the way Discipline

Space is taught between teachings, focussing only on brief pedagogical differences but not

defining the impact. The literature provides the addition of further model photographs;

unfortunately, little relationship is made between what is written, causing the photographs to

remain detached from Khan-Magomedov's writing in a similar way to the work of (Dokuchaev,

1927), (Krinskii, Turkus and Lamtsov, 1932) and (Lodder, 1983).

The continuation of Discipline Space literature, in the editions of Russian and French of Khan-

Magomedov (1990), portray the teaching of this subject from solid historical perspectives, at

times mentioning brief pedagogical 'terms' and 'concepts' of how Discipline Space became

taught. Both volumes present different accounts of the same period from different

perspectives, making each piece of literature an addition to the scholarly debate. The first to

be addressed, Khan-Magomedov (1990, Russian edition) stated that programs from the study

of 'abstract' assignments in Discipline Space were 'gradually deepened and refined, and

included new tasks' exposing a wider understanding of further work of that period, but he falls

short of elaborating on what that further work entailed.[120] In his literature we find a selection

of assignment drawings (first time presented) and model photographs, which appear to relate

to Khan-Magomedov's writings, but he 'fails' to relate directly to provide evidence of their

position within Discipline Space, leaving the welcomed pedagogical facts and graphical

[120] Khan-Magomedov, *VKhUTEMAS*, (Russian edition), p. 239, translation by author, Russian original: постепенно углублялись и уточнялись, включались новые темы и задания

representations in limbo, as seen in (1987). However, Khan-Magomedov, (1990, French edition) provides an alternative account of Space teaching, highlighting key moments in its pedagogical history outlining 'devoted discussions', focusing on student models and their 'relationships to previous student exercises', with a brief reference to examples from the 'history of architecture, but also from contemporary architecture and other artistic fields', which remain present in the pedagogy.[121] Khan-Magomedov continues with acknowledgement of apparent 'collective discussions taking place during work as well as at the end of each exercise'.[122] The brief pedagogical accounts by Khan-Magomedov remained a useful addition, providing further pedagogical understanding; however, as in Lodder and Khan-Magomedov (Russian edition), a selection of photographs are present but separate, causing the pedagogical debate to be short-sighted through not bringing both 'terms', 'concepts' and photographic material together and restricting the understanding of how Discipline Space became taught. The notion and use of the model (seen within many of the photographs) is overlooked entirely as little reference can be made to the way the models were constructed and their pedagogical use. The lack of consolidated archives of his work up to this point has made Khan-Magomedov's work difficult to understand the teaching of Discipline Space and it is hard to justify his decision to keep literature and photographs separate. Without an index to his source of illustrations for both editions, it is difficult to establish the photographs' original context, making such scholarly reference difficult to source. Both literatures by Khan-Magomedov are a valuable addition, providing solid historical accounts of Discipline Space teaching; however, a pedagogical focus on the way Discipline Space is taught is absent.

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[121] Khan-Magomedov, *VKhUTEMAS*, (French edition), pp. 529-530, translation by author, French original: l'histoire de l'architecture, mais aussi dans l'architecture contemporaine ou dans d'autres domaines artistiques
[122] Khan-Magomedov, VKhUTEMAS (French edition), pp. 529-530, translation by author, French original: Des discussions collectives ont lieu en cours de travail ainsi qu'à la fin de chaque exercice

Furthermore, in his work, Khan-Magomedov (1995) introduced a specific focus on Discipline Space, providing a contained account of the history of factual accounts of Discipline Space teaching, discussing the already-known 'four composition assignments' in similar detail and providing a detailed account of the tasks constructed.[123] Within his literature, Khan-Magomedov stated, 'The original program for the discipline, Krinskii later recalled, consisted of four composition assignments: a frontal surface, mass and weight (volume), a volumetric composition, and a depth-spatial composition. All the tasks were abstract (without a functional problem), but were of a sufficiently large dimension that their solutions approached the dimension of architectural solutions and tasks.'[124] The inclusion of reference to assignment drawings is seen to have been carried across from his literature (Khan-Magomedov, 1990), both Russian and French, exposing re-use of material but providing very little further detail relating to how Discipline Space is taught. The inclusion of the same model photographs as seen in Khan-Magomedov's previous work (Khan-Magomedov, 1987 and (1990, Russian and French edition) reveals the repetitive nature of texts on the subject exposing the continuation of scholarly disconnectivity in literature and photographs.

Beyond the solutions, Khan-Magomedov addresses the ideal scheme of the 'abstract' task as developed in 1927, mentioning before and after 'variations' of the assignments existed, similar to his prior work.[125] The notion of the word variations is vital, exposing a deep opening within the academic debate, which is not addressed; Khan-Magomedov hinting that differences occurred. Commenting further, he stated, 'While continuing to study in Ladovskii's and Dokuchaev's studios, under Krinskii's leadership, these students introduced into the Basic

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[123] Khan-Magomedov, S. O. (1995), *Razvitie psikhoanaliticheskogo metoda N.Ladovskogo na osnovnom otdelenii VKHUTEMASa-VKHUTEINa: propedevticheskaia distsiplina "Prostranstvo", teoretichaskie razrabotki ratsionalistov*, Moskva: Arkhitektura-S, pp. 287-288
[124] Ibid., p. 287
[125] Ibid., p. 288

division the psycho-analytic method already in use in VKhUTEMAS.'[126] The proposed

continuation of Ladovskii's psycho-analytical method, which Khan-Magomedov proposed had

continued into the setting of Discipline Space, gives some indication of the continuation of

development similar to (Khan-Magomedov, 1987). The lack of any coherent understanding as

to whether this remained true is not acknowledged in past scholarly work.

In the next literature, Khan-Magomedov (1996) provides a broad account of Discipline Space

pedagogy, focusing on the tasks constructed by the students stating that for, 'abstract tasks in

Discipline Space, almost all the students were taught in the main compartment to construct

through models (clay, cardboard, paper, wire, etc.)'.[127] Khan-Magomedov provides a similar

account to prior understandings exposed stating, 'The first task–to expressive architectural

volume and, in particular, on the surface expression. The second task–on the expressiveness of

mass and weight of the architectural volume. The third task–on the expressiveness of

architectural design. The fourth task–on the expressiveness of architectural space.[128] The

accounts by Khan-Magomedov are important to establish a more focused account of the

medium used during Discipline Space teaching. No direct acknowledgement is made to the

provided graphical material to establish the role the model played within Space teaching.

From 1996 to 2007 there is a shortage of scholarly work by Khan-Magomedov or any other

scholar on Discipline Space; the reason for this is unknown. The work of Khan-Magomedov

(2007) provided a welcome addition to the scholarly understanding of the subject, becoming

the most complete literature to date (which is the bulk of the review). Initially, the historical

base of the program of Discipline Space was studied with regard to its historical function

through a select amount of 'terms' and 'conditions' as seen above. The literature combines all

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[126] Ibid
[127] Khan-Magomedov, *Arkhitektura sovetskogo avangarda* [Architecture of Soviet avant-garde: Problems of Formation Master and Flow]
[128] Ibid

past literature by Khan-Magomedov on Discipline Space in one book, charting the journey of

the doctrine of the Rationalist movement from inception to completion, with a focussed

account on Discipline Space. The following section now expresses the 'terms' and 'concepts'

outlined by Khan-Magomedov, some of which have appeared previously in his work briefly.

Khan-Magomedov's literature on the focus of Discipline Space firstly mentions the way

'assignment tasks were approved' beforehand by the subject commission, providing a rare

pedagogical account of Discipline Space.[129] The inclusion of such 'selective' assignment

drawings does the pedagogical understanding of Discipline Space justice, exposing the form of

example instruction the student received in such a way as to provoke new ways to solve three-

dimensional geometrical problems. The lack of detailed investigation relating to what the

assignment portrays, its pedagogical function and the understanding of relevant material or

examples of architecture within Discipline Space is entirely omitted. Continuing with the

'terms' and 'concepts' of pedagogical function further to appear through his work and

continues by emphasising working on an assignment were carried out exclusively in 'workshop'

(studios) under the teacher's supervision.[130] In addition to the mentioned assignments and

workshop, a closely associated pedagogical task emerges before starting work at the beginning

of the academic year, when supervisors would hold 'several interviews' with students in which

they talked about the discipline, its content and importance.[131] Khan-Magomedov further

outlines that when giving tasks for 'assignments', the teacher would explain the relationship of

the task with previous tasks, and that they would demonstrate existing solutions to the task

and provide 'examples from historical and modern architectures, and from other types of

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[129] Khan-Magomedov, *Ratsionalizm* [Ratio-arkhitektura] *'Formlalizm'* [Rationalism (Ratio-architecture) 'Formalism']*,* p. 263, translation by author, Russian original: Задания предварительно утверждаются предметной комиссией
[130] Ibid., translation by author, Russian original: мастерской
[131] Ibid., translation by author, Russian original: Работа в начале учебного года открывается рядом собеседований руководителей со студентами о содержании программы

art'.[132] In the previous literature, the position and understanding of the model in terms of its pedagogical function and its relationship to the assignment drawings reveal that no connection had been established, thus the opportunity to piece together different forms of graphical material to further the pedagogical understanding had been missed. Further acknowledgement of elements of pedagogical function to explain what students should do exactly, 'models, photos and drawings of the best works done in past years should be set in the studio. These materials, in total, form system of visual materials'.[133] Furthermore, as maintained by Khan-Magomedov the notion of 'collective discussions' (between students and the head of discipline) at specific moments when solving problems (tasks) during the working process is an important pedagogical fact.[134] He continues by observing that collective discussions also took place after 'completion of each task', emphasising the position of pedagogical function.[135] In terms of synthetic tasks, a few days before the commission examination, a so-called 'collective assessment' of all works done during the course, including tasks, took place, exposing a further pedagogical function within the teaching.[136] Khan-Magomedov continues to reveal further the value of students 'collective evaluation' and discussion of each other's work in that every student saw a number of different solutions to the same task; thus, this group experience enhanced each individual student's knowledge and experience'.[137] Through Khan-Magomedov's concept of active participation in the 'criticism of comrades' work, particularly in formulating advantages and disadvantages of the work, the student could fully 'assimilate the discipline'. However, Khan-Magomedov finishes by discussing how the 'best works are

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[132] Ibid., translation by author, Russian original: существующие решения по данной дисциплине и примеры из исторической и современной архитектуры и дрискусств
[133] Ibid., translation by author, Russian original: лучшие макеты, исполненные в предшествовавшие годы, и выполняются фотографии, чертежи и увражи, что в совокупности образует систему наглядных пособий концентра
[134] Ibid., translation by author, Russian original: коллективные обсуждения
[135] Ibid., translation by author, Russian original: Такие же коллективные обсуждения происходят после каждого законченного упражнения по дисциплине
[136] Ibid., p. 264, translation by author, Russian original: коллективных оценок
[137] Ibid., translation by author, Russian original: Значение коллективных оценок и обсуждений заключается в том, что каждый студент видит ряд разнообразных решений на одну и ту же тему и тем обогащает свои знания и опыт опытом всего коллектива

photographed and selected for annual exhibitions'.[138] At the end of each synthetic task another

'interview about the previous task takes place'.[139] This is done in order to clarify questions

arising during the task, to share experiences and understand the connection of the elaborated

discipline with the forthcoming one.[140]

The lack of further interpretation beyond the exposed 'terms' and 'concepts' cause these solid

lines of inquiry, as described by Khan-Magomedov, to end immediately, exposing areas of

pedagogical understanding to be addressed to further the scholarly debate, which will include

piecing together the exposed 'terms' and 'concepts' to position how Space teaching is taught.

In addition to the important work of Khan-Magomedov (2007), Skansi (2015) has also

addressed in some detail the subject of the teaching of Discipline Space and is the most recent

article within the scholarly debate; however, through a different approach. Having analysed a

selection archival material collected from the CCA, Skansi is the first scholar to provide an

interpretation of the material through analysing a selection of photographs depicting the

system of visual materials that formed part of Space teaching. Skansi's article, while factual

throughout, relates to the influence of the boards of historical and artistic precedents on the

students ideas, as referred to by Khan-Magomedov, (Khan-Magomedov, (1990 Russian and

French), 2007). What is omitted, however, is how the 'visual archive' was used within the

pedagogy, at what stage, and the actual pedagogical function of such material.[141] Skansi's

attempt to go beyond the work of Khan-Magomedov is evident, making Skansi's work

important within the scholarly debate. The level of previous detail provided by Khan-

[138] Ibid., translation by author, Russian original: Лучшие работы отбираются для отчетных выставок и для фотографирования: эти работы остаются при концентре в качестве наглядных примеров

[139] Ibid., translation by author, Russian original: По окончании каждого синтетического задания происходит собеседование на пройденную задачу дисциплины с целью разъяснения возникающих в процессе работы вопросов

[140] Ibid., translation by author, Russian original: По окончании каждого синтетического задания происходит собеседование на пройденную задачу дисциплины с целью разъяснения возникающих в процессе работы вопросов, обобщения опыта и уяснения связи проработанной дисциплины с предстоящей

[141] Skansi, L. (2015), '*Nikolaj Ladovskij: "spazio", corso base al Vchutemas, Mosca 1920*' [Teaching architecture. Nikolaj Ladovskij: "space", the Basic Preliminary Course at Vchutemas]*, Casabella, 79 (847), pp. 3-19, for English Translation, pp. 108-110

Magomedov through his 'terms' and 'concepts', even if only briefly included in other areas of

Discipline Space teaching, would have propelled the pedagogical understanding forwards.

However, Skansi's article fails to do so. An apparent lack of understanding of the Russian

language caused Skansi's work to overlook the 'terms' and 'concepts' detailed in Khan-

Magomedov's literature, which could have been included within his pedagogical analysis on

Discipline Space to provide a different and more pedagogical focus towards Discipline Space

teaching. Such omission, having addressed only briefly the 'visual archive' and a direct analysis,

has caused the scholarly debate to remain stalled. The publication is seen to have included

other photographic evidence of Discipline Space sourced from the archive of the CCA;

however, the material presents only a visual historical account of Space teaching, with a focus

on select analysis of archival material, providing an opportunity for furthering pedagogical

discussion of Space teaching.

2.4 Gaps in Discipline Space Research–Studying its Pedagogy

Publications that contain Discipline Space teaching alongside other visionary environments

have reached saturation, exposing a plethora of gaps within the scholarly debate from

different perspectives. The intriguing, but lightly portrayed accounts must now be enhanced

and possibly reworked in light of new research and findings. We have seen the dearth of

coherent writing on Discipline Space teaching through Khan-Magomedov and others, and the

separation of detail and the chronological inconsistencies do not reduce the usefulness of the

material that is present, but they do place even greater importance on use of other research

methods to corroborate any claims or assumptions by past scholars, especially Khan-

Magomedov. Because of the scarcity of research directed towards the pedagogical

development of Discipline Space, it is suggested that new research should stress the pedagogy as a single focus.

Khan-Magomedov approaches the teaching by providing 'terms' and 'concepts' of pedagogical facts, which remain a welcomed addition to the pedagogical knowledge of Space teaching Khan-Magomedov (1990 (Russian and French editions) and 2007). Beyond the acknowledged 'terms' and 'concepts' little further understanding can be sourced, causing the debate to stall. The apparent replacement of photographs for the inclusion of text exposes the most obvious opening within the academic debate for use of such material to continue the debate on how Discipline Space is taught. Throughout Khan-Magomedov's work he clearly lacks any clear form of referencing making his work debatable even though he is the first serious scholar to address VKhUTEMAS and on Discipline Space in some detail. To base the research on a setting of fragmented understanding and lack of referencing would only produce fragmented results; with no justification that his findings are accurate. The author's archival approach remains central for furthering pedagogical understandings of Discipline Space teaching.

The focus of the research will be to locate all archival material pertaining to such a period and to collate the correct material for the purpose of the research. The proposed archival material would, in turn, be used as a means for filling the gaps, providing the necessary evidence to identify how Discipline Space is taught. If connections were to be made between the archival materials, then the apparent understanding would strengthen past interpretations or, alternatively, portray different findings, causing the academic debate to move forward from its stalled position. Furthermore, the numbers of students present during Discipline Space and the impact this had of Space teaching has remained omitted. Alongside the photographs, little pedagogical account has been included regarding the role of the medium within this context. The inclusion of the model has been mentioned but falls short of establishing what became the

primary tool of choice for constructing Space and what was its pedagogical function. Piecing together the fragmented understanding of the archival material will allow for a coherent understanding of how Discipline Space is taught.

The overall consensus of what has become revealed as gaps within the scholarly debate: how was Discipline Space taught, what was the pedagogical function of Discipline Space; what was its impact on the students learning of Space, the mass influx of teaching, the role and importance of the model and its impact on Discipline Space, all through an archival perspective. To further the scholarly debate, these areas remain important to providing a coherent understating of how Discipline Space is taught.

2.5 Gaps between Ladovskii's Theory/Pedagogy (1921–1923) and Discipline Space (1923–1926)

The outlined studies have looked at Discipline Space as a single entity without taking into consideration the pedagogical development of OBMAS, which occurred in close proximity. Past studies have identified the determinants of Discipline Space historically but do not propose methodological tools for pedagogical analysis and do not assess it comparatively between both settings during the shift of pedagogical teaching between 1921–1923 and 1923–1926. The review argues a trend of disconnectivity is apparent between Ladovskii's psycho-analytical theories, its pedagogy and, most importantly, how it came to be taught during Discipline Space based on 'weak' and short-sighted assumptions. To widen the approach to the research, it is possible to expose gaps between the two settings of teaching to clarify past assumptions to provide greater clarity towards how Discipline Space became taught.

The inclusion of the continuation of the three areas of teaching (Process, Sequence and Model-Format) remains important in comparing both pedagogical settings. We have seen in chapter 2

the level of pedagogy established by Ladovskii; however, apart from Khan-Magomedov's vague accounts of the three areas of teaching, he does not provide strong evidence for its continuation or transfer. The scholarly understanding of the continuation of theory and pedagogy is completely omitted within the scholarly debate. The increase in of number of students from a select few to over a thousand as outlined through Bokov (2014) and the impact such increase had on the teaching of Discipline Space has not been addressed. Through the lack of clear understanding of the medium used to construct Space through Ladovskii's teaching and the confusion found through the medium used during Discipline Space has lacked any pedagogical focus also based on the areas to be established between each setting. It is believed that the potential contribution of this pedagogical analysis will help formulise the interactive relations between theory and pedagogy between two distinct periods of architectural teaching.

2.6 Potential Links to be established

In spite of the apparent ease with which the paradox of the Ladovskii denunciation of modern pedagogy has generally been discerned, neither the theoretical nor the ideological framework of the modernist episode in Soviet pedagogy has been fully grasped by scholars. This thesis aims to use the theory and pedagogy of Ladovskii to investigate the impact of continuity and discontinuity during Discipline Space over the four-year period. This thesis attempts to benefit from Discipline Space research to understand the impact of the changing pedagogy – together with its continuities and discontinuities – over the four years under consideration through an archival perspective, to portray new and more complete understanding of how Discipline Space is taught. This will be achieved through the exposed 'terms' and 'concepts', archival research and three areas of Ladovskii's teaching.

2.7 Summary of Chapter

This chapter began with the definition of Discipline Space, before going on to consider the scope and approaches to study of the subject, covering a wide selection of literature between 1927–2015. This exposed a selective setting for the literature, providing key understandings and findings through specific 'terms' and 'concepts' outlined through the literature of Khan-Magomedov which appear to have framed the scholarly debate and the lack of photographic inclusion. Gaps and the targeted areas of interest within Discipline Space were then discussed exposing the disconnection between literature and archival material and the approach through bridging both as a means to establish how Discipline Space became taught. The chapter continued through identifying the gaps in areas of pedagogy between 1921–1923 and 1923–1926 and giving consideration to ways in which both areas could be brought together as a means of portraying how Discipline Space is taught. The chapter concluded by emphasising the potential links to be established which will form the comparisons between each setting.

Chapter III

'The role of archival work provides a basis for defining key questions, establishes a base of evidence, and supports debate about familiar forms and mechanisms'[142]

Archival Material (1923-1926)

3.1 Introduction

As the primary entry into the research, it is the intention to establish a solid archival approach to frame the period of research under consideration. This chapter aims to explain the proposed collection of archival material in 3 areas: (1) archival research, (2) data collection (documentation and process), and (3) repository construction. The first section includes the archival research approach followed by archival research. The second section covers 10 archives, institutions and private collectors in Russia, America and United Kingdom. The third section covers how the repository became constructed. With the aims of the research in mind, the approach to archival research made it necessary to explore the different archives of Discipline Space from a wide perspective, with the aim of eventually portraying all material in one single repository (vol. II). Justification for such an undertaking remained central to the success of the research, as without it, the opportunity to produce 'solid' research findings would have been diminished, relying on 'weak' assumptions (from previous literature).

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[142] Zald, M. N. (1993), 'Organization Studies as a Scientific and Humanistic Enterprise: Towards a Reconceptualization of the Foundations of the Field', *Organization Science*, 4 (4), pp. 513-528 as quoted in Ventresca, M. J. and Mohr, J. W. (2005), *Archival Research Methods*, Companion to Organizations

3.2 The Archival Research Approach

The adopted archival research is appropriate and valid for the following reasons. The approach to pursuing such a period of rich Soviet history presents the opportunity to visit archives, institutions and private collections; however, it is difficult to see how such visits could benefit the research directly if the intention was just to view the material only. In its most classic sense, archival methods are those involving the study of historical documents; that is, documents created at some point in the relatively distant past, providing access – that otherwise may not have been available – to the organisations, individuals, and events of that earlier time.[143] As such, historical photographs are much theorised by philosophers, historians and archivists. A notable discussion is provided by Michael Foucault in *The Archaeology of Knowledge* (1969), who argues that an archive does not 'accumulate endlessly' but is, instead, consciously composed, grouped and maintained in accordance with specific rules.[144] Samual Muller, in the *Manual for the Arrangement and Description of Archives* (1940), states that, 'An archival collection is the whole of the written documents, drawings and printed matter, officially received or produced by an administrative body or one of its officials, in so far as these documents were intended to remain in the custody of that body or of that official.'[145] Consequently, 'the historian ... must immerse himself in a whole world of knowledge, within which boundaries are not precise and the configurations of which change constantly.'[146] Archive material can help to portray a pedagogical account of everyday interactions of Discipline Space teaching by using its archival history as evidence. The outputs of archival

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[143] Ventresca, M. J and Mohr, J. W. (2005), 'Archival Research Methods', *Companion to Organizations*, pp. 805-822 in Baum, J. *The Blackwell Companion to Organizations* Wiley-Blackwell
[144] Foucault, M. (1969; 2002), *Archaeology of Knowledge*, London and New York: Routledge, pp. 145-146
[145] Muller, S. et al (1940; 1968; 2003), *Manual for the Arrangement and Description of Archives*, Chicago: The Society of American Archivists, p. 13
[146] Handlin, O. (1979), *Truth in History,* Cambridge, MA: Harvard University Press, p. 257

research and proposed categorisation will allow the period of research to be framed and used as the primary means of entry into the research.

3.2.1 Archival Research

The justification for pursuing such a time-consuming and broad approach to photographing and measuring is the importance of primary focus and the inclusion of unique and un-published material. Collecting and collating material for the research under consideration provided freedom and choice of movement that enabled the author to be selective (in the later stages of the research) about how the research would be produced, without relying solely on secondary sources. The first aspect to start the research is a 'solid' collection of archival material relating to the period 1923–1926. The approach is broad because of the uncertainty of sourced material however, as a limited understanding of the setting of locations and material became known (section 3.2.2.4). To have approached this 'huge' task assuming there would only be one or two archives would have deterred the vision and outcome of the research aims and intended repository construction. The approach would be much more focussed when targeting the correct sources of material at the correct time over the duration of the research.

3.2.2.1 Archival Limitations

Dealing with an unknown period of archival material without knowing exactly the locations of each archive will inevitably lead to dead ends based on the blind approach. When attempting such a wide approach to unknown archival work, it is important to set a form of limitations before the research commences.

The outcome of the research would have been dependent on successful collection of the necessary primary material, which would be stored in a repository before any analysis could take place. With very little being known about what was contained within the archives,

institutions and private collections, it remained important to be cautious as to whether

sufficient material would be accessed, viewed and recorded within the required time-frame. As

seen from the selected amount of historic writing on Space teaching, whether it would be

possible to locate, source and relate all the necessary material to produce solid research

findings on such a complex period when the research would be entirely self-funded, was

unknown. It remained important to be cautious when approaching the archival research on a

year-by-year basis. It must be acknowledged, it is likely the material between each archive,

institution and private collector will be stored and catalogued through different systems. It is

important to acknowledge at this point how the material may have to be brought together to

be portrayed as one collection through categorisation to provide a structured account of

material collected, providing a further limitation of how best to store the sourced material.

3.2.2.2 Background to the Archival Collections

The VKhUTEMAS collections have survived because of various individuals, institutions, family

members and collectors; some for their own family history, others for institutional history.

After disbanding in 1930, the school's original photographs lost methodological value and were

just thrown away. Ladovskii's archives disappeared in the turmoil of World War II. The true

extent of Ladovskii's archive is unknown, although some accounts reveal that many of his

works were stored in his flat in Moscow until his death. The provenance of the collections prior

to 1950 has been difficult to ascertain as all photographs were removed from Russia (illegally)

with no legal documentation of legitimacy. This made it difficult for private owners to sell their

collections as many institutions require legal proof before purchase. One example is the Tate

Gallery in London, which considered purchasing a large selection of photographs from one of

the private collections, but with no documentation of provenance available the purchase was

not made. Many of the photographs were stored in the private family archives of VKhUTEMAS graduates, and it was here that some were discovered by the prominent Soviet scholar, Khan-Magomedov, during his research between 1960–1970.

3.2.2.3 Justification for Repository Construction (Framing the Research) and its use

The problem for the researcher attempting to trace previously unpublished and undocumented assignment drawings and photographs is ever more acute. To attempt to refine and produce a clear account of Discipline Space through archival material is possible, but difficult. On occasions, some material have been published; however, due to the lack of referencing and sourcing, the photographs and material from separate archives have remained separate and never portrayed as one complete collection, making it possible for this area of archival research to be unique to this research if full access were to be granted. It is the intention of the research, based on its broad approach of archival research to produce a single repository of archival findings. The aim of producing a repository is to produce a robust and accurate document that records the specific contents of pace teaching. What makes it a repository is the format of the undertaking, as no scholar or institution has previously attempted such a task. It is anticipated that at some point, as the material will have been obtained from different sources, it will have to be categorised for the purpose of the research (section 3.4.2 and 4.3.3). The repository will create a boundary to work within and will allow the navigation of the large body of material to be accessible, as opposed to being separate within a folder. The repository will also frame the author's confidence, restricting any external influence to a focused period of research.

3.2.2.4 Identifying the Archives, Institutions and Private Collections

The archives, institutions and private collections have become the home of the Space collections, so to speak; the collection's first assets are its photographs, of which a large number are still intact and are a vital part of the archival collections, contributing more than anything else to its fragmented reception in history. Through the broad approach to archival research, it was important from the beginning to identify where all the archives, institutions and private collections (if any), were located, and what had been stored. The true understanding of where the collections originated before being sourced by Khan-Magomedov is very difficult to portray as so little information exists. Very little information exists on where or what the archives, institutions and private collections contained or how they were sourced, making identification of locations important for the success of the research.

Extensive research through secondary sources provided small amounts of information about where the material may have been stored. Lodder (1983, p. 305) made reference to the state archive in Moscow TsGALI; however, the archive is now called RGALI, which was the first archive visited. Furthermore (Ivanova-Veen, 2000) revealed the location of one archive found in collections in the Moscow School of Architecture Museum (MARKhI), which was an important archive as it was the original VKhUTEMAS. Little evidence of archive descriptions and archive numbers is known; however, what was found through the publication was a small selection of photographs which exposed archival material which may have be housed at MARKhI. Information beyond the established material about what remained stored within could not be sourced before the visit. The Shchusev State Museum of Architecture (MAUR) was discovered through a past publication (Chepkunova, 2011) which contained a select few photographs causing the institution to be an area of interest. Similar to the above archives, facts about the collection remain unknown with no reference through an archive online

system. Information about the CCA collection was obtained during a discussion with the head

of the Moscow School of Architecture Museum, Larissa Veen; during a visit to MARKhI as well

as in the most recent article written on Discipline Space (Skansi, 2015). Furthermore,

correspondence was made to the original owners of the CCA collection (Howard Schickler and

David Lafaille based in New York and London) to acquire information. A further account of the

CCA collection became established through the work of Davide Deriu (Deriu, 2012) and his

lecture at the CCA 'Modernism in Miniature' in 2012, included a small selection of photographs

of Discipline Space, causing the CCA to become an institution of primary focus. Following a

discussion with Richard Pare (the English photographer known for his work documenting Soviet

modernist architecture) at the RIBA Colin Rowe lecture series, the researcher came across a

smaller collection housed in Berlin in the Kiecken Gallery.

After searching online with the intention of establishing further archival locations, it became

apparent that a small collection could be found at the Getty Research Institute in Los Angeles.

Awareness of the collections in London came through brief discussions with members of staff

at the Courtauld Institute of Art, who pointed me in the direction of the first private collection

in London, which unexpectedly became important for the research. The collection at

Cambridge University was found through a document listing the inventory of archival material

at the Cambridge Library on the Catherine Cooke Collection, and was obtained during the early

stages of the research. The research findings above exposed archives, institutions and private

collections are located in Moscow, Montreal, London, New York, Los Angeles, Berlin and

Cambridge.

3.3 Data Collection [Documentation and Process]

During the visits to the archives, institutions and private collections, it was important for the integrity of the repository that all the assignment drawings, system of visual materials, models, workshop and exhibition photographs be photographed and measured to further the understanding of the material. The process was time-consuming but was necessary for the construction and strength of the repository, allowing the period of research under consideration to be framed as a complete account.

3.3.1 Permission from Archives, Institutions and Private Collections

When visiting archives, institutions and private collections it is important to acknowledge the purpose of the visit and how the material collected will be used. During each visit, permission was obtained to undertake the research on Discipline Space. Verbal agreements were reached that facsimiles would be used for the purpose of the research as many of the photographs are unpublished. A full account of the sourced assignment drawings and photographs will be positioned within vol. II.

3.3.2 Russia

The three archives visited in Moscow were (1) Russian State Archive of Literature and Art, (2) Moscow School of Architecture Museum, and (3) Archive of A. V. Shchusev State Museum of Architecture. Justification for choosing these three archives was based on limited information in past publications about the location and content of the archival materials; however, the approach to each remained blind. The approach to the visits remained one of chance, as neither of the collections was digitised or available online, and no information was available regarding their contents. It must be stated that sourcing and gaining access to the archives in Moscow remained the most difficult, with no understanding of what was to be sourced in each

and with no guarantee access would be granted. The following section covers the archives in Moscow that were accessed, and one private collection in Berlin, which was not visited, but relevant material was acquired through alternative means. In relation to some of the photographs published in the literature of Khan-Magomedov, it is not known if he had his own archive and where it may have been located (one assumes in Moscow), as throughout the research nothing has been sourced by the author.

3.3.2.1 Russian State Archive of Literature and Art (Fond 681 RGALI, Moscow)

The Russian State Archive of Literature and Art (RGALI) contained a vast trove of material on VKhUTEMAS with a large amount of student works sourced in the collection (Fond 681), which contained archival material on VKhUTEMAS. The vast majority of material was on the Graphic course taught within the Basic Preliminary Course, with very little in terms of photographic evidence on Discipline Space in assignment drawings, system of visual materials, models, workshop and exhibition photographs (Table 3.1). Unfortunately, no material or photographs were found relating to Discipline Space, but it was important for the purpose of commencing the archival work to rule out the archive and to move onto the next visit.

3.3.2.2 Moscow School of Architecture Museum (VKhUTEMAS Collection MARKhI, Moscow)

The second archive visited was the Moscow School of Architecture MARKhI which, to this day, is Russia's most famous school of architecture and has been in existence for more than 250 years. The systemised collection is positioned under 'educational' in the VKhUTEMAS Collection, and is housed within the original VKhUTEMAS building. The collection, stored in a paper archive, was organised in the way the assignment drawings and photographs had been preserved in earlier years, within individual paper folders containing single or sometimes numerous photographs, with brief descriptions attached to the back and written by hand (by

the author or teacher). The descriptions attached to the photographs were translated on my

return, after notes had been made of the text on the verso of the photographs. The archival

material were not contained within specific collections but were part of the overall

VKhUTEMAS Collection, making the approach to categorisation once material had become

collected as previously mentioned correct. Within the museum contained a well-maintained

collection of two hundred and forty-four original photographs of student demonstrations, all

portraying a wide selection of differently-sized models photographs along with numerous

assignment drawings (Table 3.1).

3.3.2.3 Archive of A. V. Shchusev State Museum of Architecture (MUAR, Moscow)

The final archive to be accessed in Moscow was the Archive of A. V. Shchusev State Museum of

Architecture (MUAR). At the time of visit, the MAUR archive was under refurbishment. Having

stopped by on a number of occasions and discovered there was an exhibition on VKhUTEMAS

Space drawings and photographs. The small collection of Space photographs was of

considerable importance to the research as they depicted pedagogy taking place as opposed to

the individual student model photographs (Table 3.1).

3.3.2.4 Kiecken Gallery (Berlin, Private Collector)

A smaller collection of Discipline Space photographs (60 in total) is located in the Kiecken

Gallery in Berlin with whom contact was made (Table 3.1). The collection of photographs was

purchased from MARKhI after the author's visit. Having established the collection at MARKhI

before it became sold, it was not necessary to visit the collection. Correspondence was made

through email.

3.3.3 America

Archival research in America and Canada was selected for this research. The following section covers two institutions: (1) the Canadian Centre for Architecture (CCA, Canada) and (2) Getty Research Institute (Los Angeles).

3.3.3.1 Canadian Centre for Architecture (VKhUTEMAS Collection, Canada CCA)

The Canadian Centre for Architecture, home to some of the most important architectural publications, contains a large collection of Discipline Space photographs (Table 3.1). The VKhUTEMAS collection at the CCA can be portrayed as an incomplete series of photographs, gifted by Howard Schickler and David Lafaille (both collectors of vintage photography) (section 3.3.4.2.1.). The collection has been largely catalogued through 5 separate collections, each under the name VKhUTEMAS Collection. Contained within the collections are individual models, group models, exhibitions, pedagogy, and panel boards used for didactic purposes by the professors on the Basic Preliminary Course. The collection comprises a plethora of model photographs ranging from passport size to much larger ones. The material was photographed by the author, as at the previous archives, making the visit important for continuing the research collection. Renetta Guttmann (Head, Collection Reference at the CCA) informed me that the CCA had hired a translator to translate the descriptions attached behind the photographs when they first arrived, thus little further translation was required. The descriptions attached to the archival photographs provided more details than those in the other collections visited in Moscow.

3.3.3.2 Getty Research Institute – (Series (I) School and Student Documentation, 1920–1929, VKhUTEMAS Collection, Los Angeles)

The small collection at the Getty Research institute, Los Angeles, VKhUTEMAS Collection was gifted by Viktor Kholodkov (collection of twentieth-century Russian art and design), who left

the Soviet Union in 1989, having purchased the unnamed collection directly from the artists or their families (Attempts to identify previous owners of the collection before Kholodkov has been very difficult to source). The small collection (Series (I) School and student documentation, 1920–1929) consists of 15 pieces of student's material, from identification cards to group photographs (Table 3.1).

3.3.4 United Kingdom

Four collections of Discipline Space photographs in the UK are owned by one institution and three private collections, and housed at Cambridge University Library, the Catherine Cooke Archive (Flat Box no. 26 Cambridge); Private Collection I (London); Howard Shickler Fine Art Gallery; and a further Private Collection II (London).

3.3.4.1 The Slavonic Collections at Cambridge University Library the Catherine Cooke Archive (Flat Box no 26)

The first archive visited during the final year of archival research was the Catherine Cooke Collection at Cambridge University. This special collection – Flat Box 26 (Krinskii, Ladovskii Lissitzkii and ASNOVA) – contained seven photographs depicting Discipline Space models. Unfortunately, although relevant to the research (Table 3.1), the photographs were not original but had been photographed during Cooke's numerous journeys behind the Iron Curtain, where she gained unprecedented access to previously unreachable material.

3.3.4.2 Private Collector I (VKhUTEMAS Collection, London)

The important and well maintained collection housed within an unspecified private collection in London comprised a collection of 77 photographs (Table 3.1). Most of the photographs came from two important private archives in Moscow, which the author did not know about when visiting Moscow: those of Nikolai Travin and Mikhail Korzhev, both VKhUTEMAS graduates who

participated actively in the development of Discipline Space. The collection comprised model

photographs ranging from passport size to much larger photographs not previously seen in the

archives of the institutions visited.

3.3.4.2.1 Howard Shickler Fine Art Gallery – Private Collector (VKhUTEMAS Collection London/New York)

In addition to the photographs referred to above, were 28 photographs on loan from the

Howard Shickler Fine Art Gallery in New York, purchased from Khan-Magomedov. The visit to

the Private Collector I was well timed and enabled photographs and measurement to be taken

(Table 3.1). During previous email communications with Shickler, no mention had been made

of the existence of this collection.

3.3.4.3 Private Collection II (London)

A collection of Discipline Space photographs is currently owned by the Toscafund in Central

London, a hedge fund founded by Martin Hughes in 2000. The hedge fund appears to have a

collection of 600 or more photographs (the true amount is unknown). Despite a direct

approach through email, phone and letters, access was not granted. The collection is in private

hands and has not been included in the repository but is intended to be part of future research

(section 6.4).

Archives/Institutions /Private Collections	Assignment Drawings Accessed	Model Photographs Accessed	System of Visual Materials Accessed	Workshop Photographs Accessed	Exhibition Photographs Accessed
1. Russian State Archive of Literature and Art (RGALI)					
2. Museum of the Moscow Institute of Architecture (MARKhl)	(6)	(244)	(1)	(2)	(3)
3. Archive of A. V. Shchusev State Museum of Architecture (MUAR)		(5)		(2)	
4. Kicken Gallery		(60)			
5. Canadian Centre for Architecture (CCA)		(518)	(8)		
6. Getty Institute of Photography		(4)			
7. The Slavonic Collections at Cambridge University Library, the Catherine Cooke Archive		(7)			
8. Private Collection (I) (London)		(77)			
9. Howard Shickler Gallery (London/New York)		(28)			
10. Private Collection (II)					

Table. 3.1. Number of assignments drawings and photographs collected from archives, institutions and private collections containing a multitude of material. Table constructed by author

The blind approach to archival research has enabled the research to establish a 'solid'

understanding and collection of raw material. Based on the above visits to archives, institutions

and private collections, it is important to expose the difference between photographs already

found and photographs sourced through the visits exposes the difference of material between

published and unpublished based on the material sourced from the archives, institutions and

private collections through the sourced material of 951 photographs and 6 assignment

drawings. According to Khan-Magomedov, 'Even by the most conservative estimates, the total

number of works on the type of abstract tasks carried out by students in the discipline

approached, apparently, **two thousand**.'[147] Taking into consideration published material, 445

additional images have been sourced through the archive findings (Table 3.2). It must be

acknowledged the published material presented the same archival material between

publications. Based on Khan-Magomedov's writing, material is still unsourced, in spite of

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[147] Khan-Magomedov, *Ratsionalizm* [Ratio-arkhitektura] *'Formlalizm'* [Rationalism (Ratio-architecture) 'Formalism'], p. 264

searches in numerous archives internationally. Locating additional material will remain a focus

of future research (section 6.4).

Existing Sources of Literature	Known Number of Assignment Drawings, System of Visual Materials, Models, Workshop and Exhibition Photographs
1. Dokuchaev, (1927) pp. 6-9	**(8)**
2. Krinskii, V. F. and Lamtsov, I. V. with Turkus, M. A. (1968), pp. 148–157	**(32)**
3. Lodder, (1983), pp. 128-129	**(4)**
4. Khan-Magomedov, (1990, Russian) pp. 252-331	**(506)**
5. Khan-Magomedov, (1990, French) pp. 521-555	**(473)**
6. Khan-Magomedov, (1995) pp. 85-158	**(142)**
7. Khan-Magomedov, (2007) pp. 274-331	**(473)**

Table. 3.2. Number of photographs and assignment drawings in known existence and the number of assignments and photographs accessed from archives. Table constructed by author

3.4 The Repository Construction

The approach of producing a repository of archival material on Space teaching has never

before been attempted, as far as is known, by any scholar, archive, institution or private

collection with the position of material around the world, making the approach to the scholarly

research and debate unique. The approach to the repository construction has relied heavily on

policies of museums and galleries to construct a professional repository for the purpose of the

research. The two policies of particular interest were written by the Getty Museum and

'Spectrum' as these reports issued guides, not only for the cataloguing of artefacts, but also

photographs and buildings to portray the findings in a professional manner.[148]

3.4.1 Repository Scope and Limitations

Justification for the repository construction was a requirement for material relevant to a

specific period for the research. The above archival approach has resulted in set scopes and

limitations being put in place, based on the collection of archival material to be stored within

the repository.

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[148] See the *Visual-Resources Association*, (2005) and McKenna and Efthymia *Spectrum*, (2005)

Scope

To go beyond the parameters of the collected material from archives, institutions and private

collections would result in inclusion of false or untrustworthy material and produce 'weak'

pedagogical assumptions. The limited scope enables the research to remain firmly focussed

within the boundary of the repository material, thus avoiding deviation and external influence

from the research aim.

Limitations

The impacts of the research limitations are small due to the success and meticulous archival

focus. The most obvious limitation is the availability of assignment drawings, obtained mainly

from secondary sources. It is unclear, even after visiting archives, institutions and private

collections, whether more actually exist. It is important not to set the bar too high in case the

results do not provide sufficient evidence about the way in which assignments were taught.

The limited availability is factored into the research outputs.

3.4.2 Repository Categorisation

A major part of this thesis involved categorising the archival findings for the purpose of

achieving the research aim and enabling the material to be used to produce new

understanding of Space teaching. As each archive, institution and private collection portrayed

material differently, this inconsistency rendered categorisation of the wide collection of

material amassed for this research a substantial task. While the CCA demonstrated some

consistency in its referencing system, in MARKhI and private collection (I) in London the

photographs were randomly displayed, providing no coherence or connection with similar

model types. For this reason the author provided a more coherent pedagogical understanding

of what the material portrays in a fully categorised account. It remained important based on

the collection of material to present the archival findings in an order of model type to provide

consistency and coherence to the sourced material. To have positioned the material as found

would cause confusion and difficultly through sifting through to establish the correct position

in relation to the constructed process of teaching. As a means to filter through the material to

provide greater coherence and clarity to what is actually contained within it is important to

investigate the collection with the aim of categorising it based on pedagogical connections. The

research attempts to establish connections between photograph descriptions to piece together

similarities of model types in groups, making pedagogical understanding and storage of

material more manageable. The author pieced together the collection to portray a coherent

pedagogical understanding of the relationships between each model determining the set types

they belong in. The author established seven model types which will act as individual

categories which will be addressed in more detail (chapter 5). The result of the categorisation

will be portrayed within individual sections in the repository, exposing different model types. It

is the intention of the author to expose new pedagogical understandings of Discipline Space,

based on the categorisation, which will be an important part with research methodology and

the core chapter to the thesis (chapter 4 and 5).

3.4.3 Repository: Realization

Attempting to bring together many different collections to portray specific assignment

drawings, system of visual material, models, workshop and exhibition photographs under

different descriptions caused much confusion, as dates and descriptions in different archives

did not correspond between each as well as through secondary sources as a result of poor

translation and mis-understanding of the period under consideration. To have assumed the

descriptions remained correct based on secondary sources would have caused problems

further on in the research, justifying an initial broad archival approach to the research. It is

important for categorisation to provide consistency to allow research to be based on 'correct'

and 'solid' understandings. Dates and descriptions must be scrutinised to assess the strength of

detail attached to each photograph, therefore interpretation of these details became

necessary (Table 3.3). Modifying and improving the descriptions and dates to create

consistency throughout became an important task for assessing the strength of the collection

and providing a complete and exact account of material sourced.

Inclusion of Russian translation was important at this stage to assure the correct translation

occurred. The descriptions attached to the CCA photographs portray that they were taken

between 1920–1926. In actual fact, Discipline Space was not formed until 1923, making such

description misleading. The discrepancies had to be corrected before case selection and

analysis could take place, providing a more robust understanding and aligning with dates.

Descriptions attached to many of the photographs also required modification. What changed is

the additional wording around the more important details contained within the descriptions.

For the system of visual materials, the descriptions relating to material within the photographs

were to become precise. The photographs required adjustment to relate the descriptions to

the material contained within the photograph (Table 3.3). This produced more consistency

within the repository and throughout the thesis. For the assignment drawings, little needed to

be changed as the descriptions appeared correct throughout.

Description from Archives, Institutions and Private Collections	Description Modification (by the Author)
1. View of photographs and illustrated pages, pinned to presentation boards used for didactic purposes by the professors of the Basic Preliminary Course at the VKhUTEMAS and the VKhUTEIN, Moscow Feb 1926–1930	**1.** System of Visual Materials photographs and pages of text portraying examples of High Renaissance architecture 1400s–1500s (1923-1926)
2. Photograph of a student's model on the topic 'Constructing a Voluminous Form with Finding and Expressing Mass and weight' for the 'Space' course at the VKhUTEMAS (Higher State Artistic Technical Studios), Moscow between 1920 and 1926	**2.** Construction of volumetric bulk form with the Identification and Expression of 'Mass and Weight' (1923–1926)

Table. 3.3. Example of description modification between the System of Visual Materials and model photographs from the archives to the repository. Table constructed by author

3.4.4 Repository Arrangement

The repository is made up of assignment drawings, system of visual materials, models, workshop and exhibition photographs with distinct boundaries and thresholds. Each photograph exists as a distinct component. The act of categorising the archival material was not to be interpretive or arbitrary and was to reflect the collection as one, to align with the research aims. Each assignment drawing, system of visual material and model photograph was subsequently labelled with individual areas split between 10 sections: (1) assignment drawings, (2) surface, (3) frontal space, (4) space and volume, (5) form, (6) mass and weight, (7) deep space, (8) transformation, (9) system of visual materials, and (10) teachers, students and exhibitions. This made the process of documenting the contents of the archives more manageable. Following careful consideration of the archive contents, a criteria photograph was chosen to define separate sections in the repository. The photographs are of a sufficient size to enable appreciation of the detail that is more difficult to discern in the main repository. The compromise was in displaying the photographs in the largest format possible (not necessarily to the exact size of the photograph) whilst keeping the repository to one manageable volume.

*Organization of Space over a
Horizontal Surface (Rectangular,
Square, Round)*

Date: 1923-1926

Dimensions: 7.7 x 12.3 cm

Archive: CCA

Archive No: PH1998:0014:277

Description: Photograph depicting a model for the
demonstration Organization of Space over a Horizon-
tal Surface (Rectangular, Square, Round) constructed
using card and wire

**Figure. 3.4. Screen shot taken from repository (vol. II) portraying photograph example within the
repository description, date, dimensions, archive, archive no and a brief description of the
photograph**

Each photograph is described as follows: (1) title, (2) date, (3) dimensions, (4) archive, (5)

archive no, and (6) description, providing sufficient detail to understand each assignment

drawing, model, system of visual materials, workshop and exhibition photograph contained

within the repository (Figure 3.4). The works could have been compiled according to their

dimensions, colour, materiality or any other physical attributes, and then grouped according to

those criteria. Positioning the works according to model type was the most effective method of

cataloguing such a large quantity of assignment drawings, models, system of visual materials,

workshop and exhibition photographs, enabling the material to be viewed coherently for the

author's benefit. This also enabled the author and reader of the repository to 'navigate'

through the collection and to appreciate particular moments of its history. Consideration was

given to the creation of a database due to the approach of the research; however, it was

deemed sufficient to construct a physical repository. The proposed database of digitizing the

repository may be considered appropriate for future research (section 7.4). Should any

collection include further material, extended or altered in any way, this repository can

accommodate such changes quickly, without the entire cataloguing system being affected.

3.4.5 Secondary Sources: Assignment Drawings

The approach to secondary sources, taking all archival collections into consideration, became

important for the assignment drawings only (Table 3.5). In MARKhI, the number of assignment

drawings sourced (6) remained few, thus secondary sources from Khan-Magomedov literature

were acquired (Khan-Magomedov, 1990, (Russian and French) edition, 1995, 2007) to

complete the collection of all existing assignment drawing material and positioned in section 1.

Secondary Sources	Assignment Drawings
1. Khan-Magomedov, (1990 Russian edition) pp. 249-251	**(13)**
2. Khan-Magomedov, (1990 French edition) p. 520	**(2)**
3. Khan-Magomedov, (1995), pp. 66-81	**(13)**
4. Khan-Magomedov, (2007), pp. 266-272	**(14)**

Figure. 3.5. Number of assignment drawings in known existence through the literature of Khan-Magomedov. Table constructed by author

3.4.6 A Repository of Assignment Drawings, Models, System of Visual Material, Workshop and Exhibition Photographs (1923-1926) (vol. II)

The repository contains a full catalogue of assignment drawings, models, system of visual

materials, workshop and exhibition photographs and has been constructed to a professional

standard, including as much detail as possible from all archives, institutions and private

collections, enabling the research to commence.

3.5 Summary of Chapter

The chapter began by addressing archival research, followed by discussion of the second data collection, which covered ten archives, institutions and private collections which provided the necessary material. The third part discussed the repository construction and how the sourced archival material was positioned within the constructed repository to frame the period of research between 1923–1926. The approach to archival research was central to the aims and success of the research and, a lack of consistency and unreliable accounts by past scholars having been established, it was decided that a thorough and methodical approach would be required. The effort involved in sourcing, visiting and photographing the archival material should not render it more important or significant than the teaching of Discipline Space. In fact, the opposite can be posed. In spending considerable time, energy and materials in constructing and then painstakingly photographing Discipline Space photographs, the collection is demonstrating the importance of the teaching that rests upon it. Once the author understood the complete set of the material available around the world a considered of choices will be made to interpret the teaching of Space based on selective evidence collected through the constructed repository (vol. II). It goes without saying that the archives, institutions and private collections accessed have resulted in 'solid' primary evidence being collected. To maintain the flow of the thesis from archival findings outlined above into case analysis in the forthcoming chapter, the author has chosen to position the research methodology and methods within appendices I and II respectively which provides a detailed account for how the research findings will be found in conjunction with the sourced archival material.

Chapter IV

Case Studies, Analysis and Assessment

4.1 Introduction

This core chapter provides the case studies, analysis and assessment. The chapter is organised in 3 main sections: (1) general introduction to case studies, (2) process, sequence and model-format analysis, and (3) Discipline Space assessment. The chapter introduces the 39 case studies leading to analysis in the three areas of teaching. Following the case selection procedure based on the constructed 'process' of teaching and the case studies explained in the previous chapter, this chapter carries out pedagogical analysis of selected stages within the 'process' of teaching to analyse and assesses Discipline Space through the methods specified in the adopted Space methodology. The chapter then assesses the findings in 6 areas.

4.2 General Introduction to Case Studies

This general introduction discusses the 39 case studies chosen to represent the pedagogical activity in Space teaching. The case studies appear in chronological order according to their position within the 'process' of Space teaching (Table 4.1 and pull-out II).

The case studies chosen for analysis consist of the following: Case I (stage 3) contains only 1 photograph, i.e., 'Discussion of Assignments'(Figure 4.2); Case II (stage 4) 'Assignment Drawings', 7 assignment drawings chosen both from primary and secondary sources (Figures 4.4–4.10); Case III (stage 5) 'System of visual Materials', contains five examples of architecture

and art (Figures 4.11–4.15); Case IV (stage 6) 'Workshop (Lecture Hall)', contains 1 photograph (Figure 4.16); Case study V (stage 8) type 'Surface', contains 4 photographs (Figures 4.18–4.21); Case study VI (Stage 8) type 'Frontal Space', contains 3 photographs (Figures 4.22–4.24); Case study VII (Stage 8) type 'Space and Volume', contains 3 photographs (Figures 4.25–4.27); Case study VIII (Stage 8) type 'Form', contains 3 photographs (Figures 4.28–4.30); Case study IX (stage 8) type 'Mass and Weight', containing 3 photographs (Figures 4.31–4.33); Case study X (stage 8) type 'Deep Space', contains 3 photographs (Figures 4.34–4.36); Case study XI (stage 8) type 'Transformation', contains 3 photographs (Figures 4.37–4.39); Case study XII (Stages 9–12) contains only 1 photograph (Figure 4.40) and relates to four stages, within which the four stages of pedagogical functions occurred; Case study XIII (Stage 16) contains two photographs of 'Exhibitions of Student Works' (Figures 4.41–42). The case studies are used to illustrate new pedagogical understandings to further the scholarly debate on how Discipline Space is taught. It was not possible to portray a visible line of teaching from the beginning to the end of the 'process' based on the archival material available in comparison to the stages of teaching, thus justifying why only 10 of the 17 stages have been selected for analysis.

The relationship of the chapter to the first constructed pull-out is important for illustrating, in graphic form, how Discipline Space, is taught. All three areas of pedagogy have been combined, portraying the stages in running order to show how the students would have moved through Space teaching. It is suggested that the reader has pull-out I open while reading the chapter. The diagram was designed to reflect a continuing rhythmical process of Space teaching. The thickness of arrows for each stage dictates the different levels of focus through analysis and also the amount of chosen case studies. The second pull-out, positioned behind the first, depicts a table showing the 'process' through individual categories and stages showing the secondary/archival sources consisting of all information used in the construction of the first

pull-out. It is important for the reader to understand the author's approach to the research,

the different material included and the way each is used to portray the teaching of Discipline

Space.

Discipline Space Process of Teaching (1923–1926)	Case Study Selections
Category 1: Assignments	
Stage 1. Introductory Lecture and Program Content	
Stage 2. Organising Equipment	
Stage 3. Discussion of Assignments	**(1)**
Stage 4. Assignments Issued	**(7)**
Category 2: Working Process	
Stage 5. System of Visual Materials	**(5)**
Stage 6. Workshop (Lecture Hall)	**(1)**
Stage 7. Collective Discussions (i)	
Stage 8. Construct through Modelling	**(22)**
Category 3: Dialectic Process	
Stage 9. Collective Discussions (ii)	**(1)**
Stage 10. Collective Evaluation	Same as above
Stage 11. Assimilate the Discipline	Same as above
Stage 12. Development of Critical Skills	Same as above
Category 4: Evaluation and Conclusion	
Stage 13. The Correction of Shortcomings	
Stage 14. Examined by Commissions and Assessment	
Stage 15. Improve Mark	
Stage 16. Exhibition of Student Works	**(2)**
Stage 17. Concluding Interview	

Table. 4.1. Stages of Discipline Space pedagogy in comparison with selected case studies. The case studies have been chosen from a multitude of archives, institutions and private collections. Source: currently housed at Canadian Centre for Architecture (CCA), Moscow School of Architecture (MARKhI), Archive of A. V. Shchusev State Museum of Architecture Museum (MUAR), Kicken Gallery, Private Collection (I) (PC) (See pull-out II further full account). Table constructed by author

4.3 Process, Sequence and Model-Format Analysis

The 'process' of Space teaching has been divided between four categories and seventeen

stages of pedagogy, i.e.: **Assignment**: (1) introductory lecture and program content, (2)

organising equipment, (3) discussion of assignments, (4) assignments issued; **Working Process:**

(5) system of visual materials, (6) workshop (lecture hall), (7) collective discussions (i), (8)

construct through modelling; **Dialectic Process**: (9) collective discussions (ii), (10) collective

evaluation, (11) assimilate the discipline, (12) development of critical skills; **Evaluation and**

Conclusion: (13) the correction of shortcomings, (14) examined by commissions and

assessment, (15) improve mark, (16) exhibition of student works, and (17) concluding interview.

The author has established, specific 'terms' and 'concepts' to define the grouping of stages established which appeared more pedagogical than others which have been defined as categories. Each of the four categories is positioned to acknowledge the separation of pedagogical function through which the student progressed during the learning of Discipline Space. The first category is based on the first four stages of selection with focus on the inclusion of 'assignments'. The second category is 'Working Process' were the construction of Space occurred. The third to be defined as a category is 'Dialectic Process' which defined discussions of ideas and opinions. The fourth and final 'term' and 'concept' will be the fourth category 'Evaluation and Conclusion' as evidence suggests the final stages of teaching relating to the conclusion of the students work.

The followings stages: (3), (4), (5), (6), (8), (9–12), and (16) will be analysed through the chosen assignment drawings, system of visual materials, models, workshop and exhibition photographs (pull-out I). The remaining stages: (1), (2), (7), (13), (14), (15), and (17) (all secondary) are omitted through analysis as no archival material could be related to all these stages. Brief accounts are mentioned between analyses of the stages to continue the flow of the pedagogical interpretation of how Space became taught. The author intends to include further 'terms' and 'concepts', arguing they could not be an individual stage by itself, but be positioned within the chosen stages as further context. It must be acknowledged, not all sourced 'terms' and 'concepts' have been included to frame the period of teaching, as they appear at times too secondary and simply too many (appendix I).

The first two stages consist of stage 1: 'Introductory Lecture and Program Content', and stage 2: 'Organising Equipment'. Analysis of case 1 will begin with stage 3.

4.3.1 Stage 3–Discussion of Assignments

Only one case study is sourced within the repository depicting pedagogical discussion of significance for the understanding of Discipline Space assignments, which were sourced when visiting the Archive of A. V. Shchusev State Museum of Architecture Museum (**MUAR**). The photograph is rare and important within the stages of teaching, capturing the close working discussion of assignment drawings, which took place during the early stages of teaching. The photograph shows Vladimir Krinskii with Mikhail Korzhev (left, in checked shirt) and Mikhail Turkus (wearing tie) discussing assignments with 8 unknown students positioned around a table discussion ideas. The following section covers the first photographic analysis of Case I (Figure 4.2) through the use of Code (A) outlined in the Discipline Space assessment (See appendix) to provide a coherent understanding of the pedagogical function in the chosen case study. The third stage of Discipline Space teaching begins by discussing the forthcoming assignments to be issued to the students.

Figure. 4.2. Krinskii with students and Korzhev (left, in checked shirt) with Turkus (wearing tie) discussing assignments (Gelatin Silver Print) source: currently housed at the Archive of A. V. Shchusev State Museum of Architecture MUAR, Archive No:

This stage of the pedagogy is the first stage in the instruction of Space through a form of

assignment discussion. The newly appointed leader, Krinskii, appeared central to the discussion

of assignments drawings, having become the leader at the beginning of the Basic Preliminary

Course. Krinskii's role is harder to determine as no archival documents disclosing the extent of

his involvement in the preparation of assignments have survived. However, assignment

drawings by Turkus have been sourced (vol. II, section 1), although no connection can be

established with what is seen during stage 3. The location for the discussions appears to have

been a faceless classroom, making it hard to establish its location in VKhUTEMAS; however, the

discussions took place with a small group of teachers and students present, exposing the

collaborative approach to the production of assignments. The age of those depicted is quite

revealing as all three teachers present during the stage of teaching were previously students of

Ladovskii, yet they appear much older in comparison with the students present. This stage of Space teaching provided a multitude of activity in one stage, (discussion of assignment drawings and development of ideas) through the broad perspective as the students present appear to be involved within discussions. Based on the inclusion of tools present, changes were being made to the assignments, illustrating the exchange of opinions and ideas between the teachers. The inclusion of sheets of paper and drawing apparatus provides evidence of the assignments being created during the discussion, exposing a progressive setting of ideas and instructions becoming developed in the moment. The word 'discussion' suggests that the instructions were not prescriptive, but were open to interpretation through the inclusion of both teacher and student. It is intriguing to acknowledge that some students were present as ideas were being discussed, giving them an advantage over absent students as they would have a good idea of what was expected before beginning their assignment. At this stage of teaching, this would only result in a minor advantage, as the following stages had little direct influence towards how Space was constructed, as will be exposed. The pedagogical activity presents a cross-pedagogical approach between teacher and students, providing a setting of development prior to allocation of instruction. The dynamic of this stage of teaching appears abstract in approach, with no clear direction or pedagogical divide exposing a free form of Space teaching with emphasis through developing the teaching in the moment. The approach to this form of abstract teaching sets the scene for what is to be exposed throughout the duration of Space teaching and learning.

4.3.2 Stage 4–Assignments Issued

Through published and unpublished assignment drawings, the approach to case studies

selection has resulted in assignment drawings produced by Lamtsov being chosen. The first

case study (Figure 4.4), 'January 18th, 1924 – Ivan Lamtsov: '**Form',** contains both text and

drawings, including three line-drawings. The second case study (Figure 4.5), '1924/1925 – Ivan

Lamtsov: '**Space',** contains no text, and only two drawings are shown, both in elevation and

plan. Attached to the elevation drawings are dimensions. Positioned around the drawings are

dimensions for each. The third case study (Figure 4.6) 'November 24th, 1924 – Ivan Lamtsov:

'**Surface',** contains both text and drawings, with 3 elevation drawings and 1 drawing in plan,

with three elevations and one section drawing shown in plan. To the bottom right, a signature

can be seen, evidence that Lamtsov signed off his drawings. The fourth case study (Figure 4.7)

'January 2nd, 1925 – Ivan Lamtsov: '**Form',** contains 3 drawings as a form of instruction, with

written instruction present through a separate sheet of paper. The fifth case study (Figure 4.8)

'March 2nd, 1925 – Ivan Lamtsov: '**Mass and Weight',** contains only 2 line-drawings with no

written instruction. The sixth case study (Figure 4.9) 'February 8th, 1926 – Ivan Lamtsov: '**Mass**

and Weight', contains both text and drawings, with 2 elevation drawings and 1 in plan with

dimensions positioned around each. The seventh case study (Figure 4.10) February 8th, 1926

Ivan Lamtsov: '**Mass and Weight',** also contains both text and drawings with the form of

instruction, with two drawings, 1 in elevation and 1 in plan. Similar to the previous drawings,

dimensions appear positioned around the drawings.

The following section now analyses the selection of case examples of assignment drawings

(Figures 4.4–4.10). It analyses the differences in assignments through: assignment drawing

type, instruction, line drawings per assignment, eventually comparing the similarities and

differences between each portraying a sequence of how the assignments were issued overall.

A table has been established to portray the separation of pedagogical functions which will be addressed within the assignment drawing analysis through individual areas.

After approval by the teachers through the previous discussions, the assignments marked the entry point into Space learning for the students who then progressed to a step-by-step form of instruction. The pedagogical function of the assignments were drawn and written on fragile manuscript (paper and ink), which marked the start of the transfer of Space instruction from the prior stage which captured the close proximity of assignment drawing construction. The assignments were issued by different teachers, as evidenced in the individual 'initial' attached to the assignment (vol. II, section 1). The assignment drawings were constructed and used so that students did not have to remember the instruction and were intentionally devoid of any historical or representational references (which would be an individual stage of learning, stage 5). During this stage, the purpose was to stimulate abstract thinking.

Discipline Space Assignments Drawings (1923–1926)	Conditions	Questions	Problem-solving tools	Method of solution	Model/ Drawing	Scale and Deadline
1. Form, The identification of a specific form (Cylinder) with the inclusion of complementary Elements in space, January 18th, 1924	Yes	Yes	Yes	Yes	Model	Yes
2. Identification and Expression of Space, 1924/1925	No	No	No	No	No	No
3. Surface, November 24th, 1924	Yes	Yes	No	Yes	Model	Yes
4. Form, January 12th, 1925 (parts 1 and 2)	Yes	Yes	No	Yes	No	No
5. Mass and Weight, March 2nd, 1925	Yes	Yes	Yes	Yes	No	No
6. Mass and Weight, February 8th, 1926	Yes	Yes	Yes	Yes	Model/Drawing	Yes
7. Mass and Weight, February 8th, 1926	Yes	Yes	Yes	Yes	Model/Drawing	Yes

Table. 4.3. The 7 assignment drawings analysis exposing instructions: conditions, questions, problem-solving tools, method of solution, model/drawing, scale and deadline. Table constructed by author

The first assignment (Form, The identification of a specific form (Cylinder) with the inclusion of complementary Elements in space, January 18th, 1924), Case II, (Table 4.3 and Figure 4.4) contained both hand written text and line-drawings which asked the student to reveal the following as a primary means of instruction stated by Lamtsov, 'under the condition of scattered light, as angles formed by the sides of surface A, as the convex cylindrical (1/4 of cylinder), sides B and C as a plane. Also identify the volume of the given installation, and from some points (one such point is required) show the audience that the volume is 1/4 part of cylinder, the installation should be considered at the height of the viewer's eyes. Contrasting shapes of plane, the line in the form of rod and relief, texture and volume of shapes which can be introduced only as a support for a clearer perception of the given shape's volume.'[149] We find a number of conditions and questions within the assignment which appear written as complex instruction by Lamtsov who further outlines, 'shape and its size; its location: the situation in relation to the viewer and the Space coordinates, and also the lighting conditions. Included within the instruction is problem solving tools stating, 'contrasting shapes of plane, the line in the form of rod and relief, texture and volume of shapes which can be introduced only as a support for a clearer perception of the given shape's volume.'[150] Further stated by Lamtsov, 'The scale A model should be presented on a scale of the actual size of 0.01.'[151] Present through the drawing was the option to construct through modelling, with no mention of drawing. Further included was a deadline for the assignment to be constructed. Present
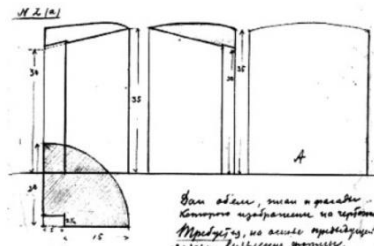
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[149] Form (The identification of a specific form (Cylinder) with the inclusion of complementary Elements in space), January 18th, 1924, translation by author, Russian original: при условии рассеянного света, как то углы образуемые сторонами, поверхности А, как выпуклую цилиндрическую (1/4 цилиндра), стороны В и С как плоскости. Выявить также объем данного сооружения, а с некоторых точек (одна такая точка обязательна) показать зрителю, что данный объем составляет ¼ часть от цилиндра, рассматривать сооружение на высоте глаза зрителя. Контрастирующие формы плоскости, линии в виде стержней и рельефа, фактура, а также объемы формы которые могут быть вводимы лишь как вспомогательные для более ясного восприятия данной формы объема

[150] Ibid., translation by author, Russian original: Контрастирующие формы плоскости, линии в виде стержней и рельефа, фактура, а также объемы формы которые могут быть вводимы лишь как вспомогательные для более ясного восприятия данной формы объема

[151] Ibid., translation by author, Russian original: Представить макет (модель) в масштабе 0,01 натуральной величины
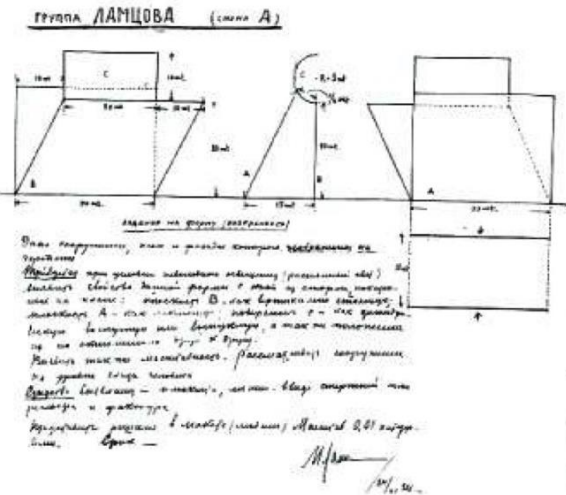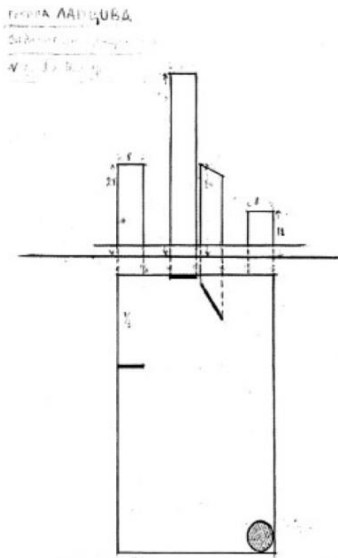
within the assignment drawing is 4 line drawings appearing at the top in elevation and plan included to inform the written instruction through a graphical means. The inclusions of both forms of instruction provided evidence both were to function as one instruction. The assignment provides a robust approach to the transfer of instruction and ideas and is seen to contain 6 individual areas of instruction. The instructions is seen focussed through the written words on Lamtsov, revealing, at time, complex wording which would have to be understood and interpreted by the student. The difficulty found through analysis is the relationship between instruction and drawings require interpretation for both to be understood as one form of instruction, exposing a form of disconnectivity or abstract relationship.

One of the more interesting assignments put forward by Lamtsov, based on the absence of written instruction is the second assignment drawing put as simply 'Identification and Expression of Space' in 1924/1925 (Table 4.3 and Figure 4.5) portraying a horizontal plane (rectangle) on which four forms are located. The task portrayed to identify the relationship and proportion of elements, revealing the movement from one element to another and introducing different types of rhythm into elements (such as growing horizontally, uniform, rapidly-growing vertically) providing an actual site (boundary or plane) and including more than one building of individual vertical volumes. A corresponding system of rhythmic modulation each of the subsidiary forms appear as the instruction. The lack of written instruction provided would mean reference to condition, questions, problem solving tools, method of solution and model/drawing, scale and deadline were omitted entirely, exposing an alternative pedagogical approach to construct Space, which differs from the prior assignment. It is the author's interpretation based on the lack of instruction; the specific pedagogical approach focussed the student's interpretation on the drawings as instruction providing an alternative approach to Space learning through an alternative format of assignment.

Figures. 4.4–4.6. Three assignment drawings by Lamtsov consisting of top: 'Form', bottom left: 'Space', and bottom right: 'Surface' each assignment drawing contained in different formats and levels of instructions (source: Khan-Magomedov, 2007, pp. 266–269)

The third assignment, 'Surface', November 24th, 1924 (Table 4.3 and Figure 4.6), portrays the following written instruction outlined by Lamtsov, 'You have to identify properties giving consideration to the diffused light (partial) of the given form from one of the sides shown on the plan: plane B as a vertical standing, plane A as inclined surface, plane C as cylindrical concave or convex as well as the way they are positioned in relation to each other) to identify the scale of the buildings in relation to the human scale, identifying planes, lines in the form of

110

rods or relief and texture.'[152] According to further requirements of the instruction, 'the plane

must orient frontally to the viewer; it must have minimal thickness and the surrounding

environment is not taken into consideration.' These planes were tilted and merged into each

other; according to Lamtsov, 'In regards to rows of differently arranged identical forms, one

can speak of a calmer or less irritable movement, and vice versa. When perception requires

constant exertion, it leads to a faster appearance of fatigue if there is no other neighbouring

row with another accent that would have allowed for a rest.'[153] The scale to present solutions

in a physical model with a scale or 0.01.[154] Similar to the first assignment drawing, reference to

constructing the instruction through the model can be seen provided. The assignment did not

contain any problem-solving tools, but did provide a method of solution outlined within the

provided questions. The included 3 line-drawings provided a connection to the written

instruction, however, only abstractly, as even the author had to interpret the relationship

between both for each to be understood as one instruction. Similar to the first assignment

drawing, the abstract relationship between is remained present.

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[152] Surface, November 24th, 1924, translation by author, Russian original: Требуется при условии неполного освещения (рассеянный свет) выявить свойства данной формы с одной из сторон, показанных на плане: плоскость В – как вертикально стоящую; плоскость А – как наклонную; поверхность е – как цилиндрическую вогнутую или выпуклую, а также положением по отношению друг к другу. Выявить также масштабность, Рассматривая сооружения на уровне глаза человека Средства выявления – плоскости, линии – в виде стержней или рельефа и фактура

[153] Lamtsov, 'K voprosu o tonal'nosti v arkhitektⷣe' as quoted in Vronskaya, A, *The productive unconscious: architecture, experimental psychology and the techniques of subjectivity in Soviet Russia, 1919-1935*, p. 192, translation by Vronskaya, Russian original: При рассматривании рядов одинаковых форм, но с различной частотой в их расстановке-можно говорить о более спокойном движении и менее раздражительном, и наоборот, когда при рассматривании требуетс беспрерывное напряжение, отчего быстрее появляется усталость, если нет еще по соседству другого ряда с другим акцентом на котором можно было бы отдохнуть

[154] Surface, November 24th, 1924, translation by author, Russian original: Представить решения в макете (модели) масштаб 0.01
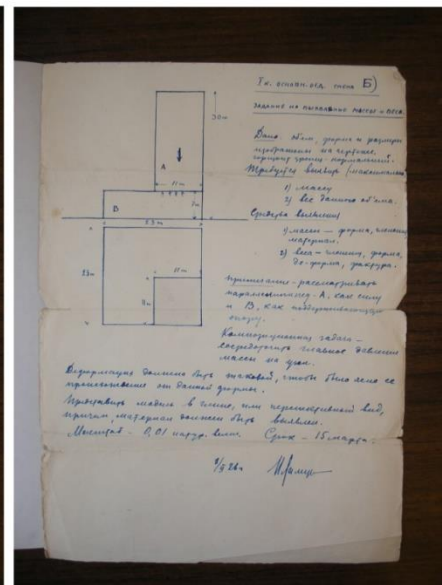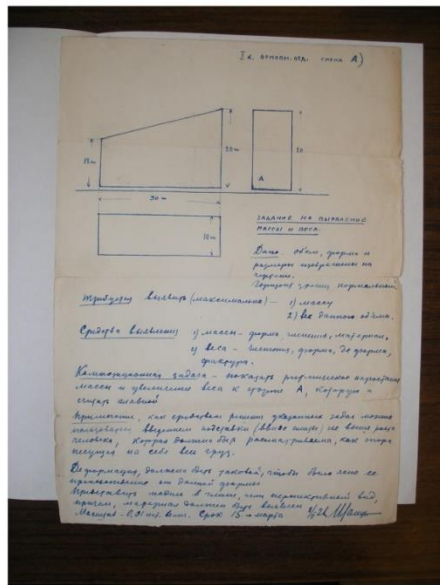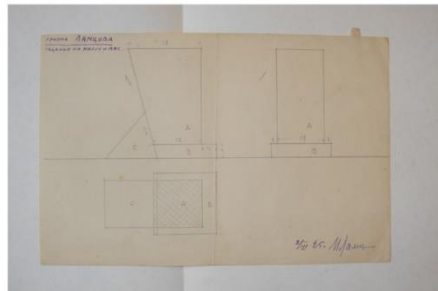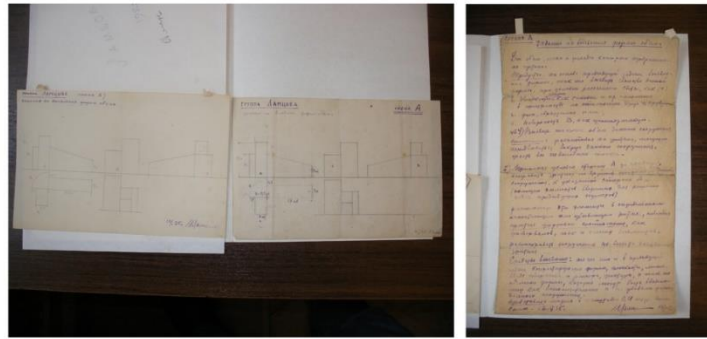
Figures. 4.7–4.10. Four case study assignment drawings by Lamtsov, consisting of one assignment on 'Form' consisting of two parts and three assignments on 'Mass and Weight'. Each assignment depicts different pedagogical functions and formats based on the amount of instructions provided. Source: currently housed at Moscow School of Architecture Museum MARKhI Archive No: Top, Кп 501-29-30 – MARKhI. Middle: Кп 501-31 – MARKhI. Bottom Left: Кп 501-43 – MARKhI. Bottom right: Кп 501-44 – MARKhI

The fourth assignment drawing, 'Form' January 12th, 1925, provides two pages of line-drawings and a separate page of written text (Table 4.3 and Figure 4.7). The instruction stated by Lamtsov, 'the task should focus on the detection of the shape's features under the influence of scattered light in as much as: (1) the old planes, just as their place in the open in relation to each other, (2) the corners created by them (3), the surface B as the supporting one, and (4)

also measure the volume of the given installation.[155] Further stated by Lamtsov, 'conditionally

taking into account side A as the main side, direct the viewer to the other side of the

construction. For (belonging to) the indicated side A (with the help of the elements integrated

for solving the task of the previous points)'.[156] The instruction contained elements of

conditions, questions; problem-solving tools and method of solution, however, the lack of

scale, and deadline to construct have been omitted providing a reduction in instruction with no

evidence of the medium of construction. What can be established as further instruction

through the two separate pages are five simple line-drawings depicting a small selection of

individual forms working together providing basic instruction for what is to be constructed. The

simplicity of drawings provided and written text revealing a direct relationship between both

through the positions of the 'Surface' of forms exposing pedagogically both forms of

instruction worked as one instruction. So far through the assignment drawing analysis, there

appears to be a trend of assignments with text and drawing and a selection without, exposing

different pedagogical functions between each.

The next assignment drawing, 'Mass and Weight' March 2nd, 1925 (Figure 4.8), portrays a

different assignment characteristics to the above assessment, lacking written instruction

containing a set prescribed line-drawings as instruction. The line-drawings contained three

elements and were proposed and presented in a different formation. What can be established

the justification for so little mass presented through the drawings is contradicted by the

additional support provided by the additional element (C), which would seem to act as a

secondary support, stopping force (A) from dislodging from its position. To expose the

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[155] 'Mass and Weight' March 2nd, 1925, translation by author, Russian original: задача должна быть сосредоточена на обнаружении признаков фигуры под воздействием рассеянного света: (1) старые плоскости, их место в открытом по отношению друг к другу, (2) созданные ими углы (3), поверхность в качестве поддерживающей один, и (4), также измерить объем установки
[156] 'Mass and Weight' March 2nd, 1925, translation by author, Russian original: условно принимая во внимание сторону А в качестве основной стороны, направьте зрителя на другую сторону конструкции. Для (принадлежащей) указанной стороне А (с помощью элементов, интегрированных для решения задачи предыдущих точек)

perceptual understanding of 'Mass and Weight', surface details would have to be included to portray the visual perception of the effects of weight compressing onto the mass. The additional element (C) does offer an understanding of weight being absorbed, perhaps reducing the need for such detailed description made the drawing self-explanatory. The absence of written instruction causes the line drawings to be an abstract interpretation for an abstract solution. This would be read and understood as the form of instruction by the student.

The sixth assignment drawing, 'Mass and Weight', February 8th, 1926 (Table 4.3 and Figure 4.9), both text and drawing is provided. Lamtsov's description of instruction states, 'show the rhythmic increase in mass and the increase in weight in respect to site A which should be considered the main site'[157] Also stated, 'as a means for the calculation of the given task, a supporting device (in form of plates), no taller than a person's height can be introduced. The device should be considered as a support which bears all weight'. According to Lamtsov, 'the model should be constructed either out of clay or in perspective in which the required material should be given.'[158] The choice of model, perspective drawing was included within, however, it is established within the assignment, conditions, question, problem-solving tools, method of solution, scale and deadline was provided. What can be seen are line drawings in plan, section and elevation, with the inclusion of drawing dimensions. The relationship to what is asked through written instruction to what the drawings portray is remarkably different; revealing a form of interpretation would be required to understand both forms of instruction provided to be constructed.

Similar to the assignment above, 'Mass and Weight', February 8th, 1926 (Table 4.3 and Figure 4.10) used in the same drawing, the format contained both text and drawing providing minor

[157] Mass and Weight, February 8th, 1926, translation by author, Russian original: показать ритмическое увеличение массы и увеличение веса по отношению к участку А, которое следует считать основным участком
[158] Mass and Weight, February 8th, 1926, translation by author, Russian original: модель должна быть построена либо из глины, либо в перспективе, в которой необходимо предоставить требуемый материал

changes with the inclusion of two elements in the line drawing, exposing a pedagogical difference from the prior assignment. The separation of the two volumes is better presented than in the previous assignment, exposing pedagogical difference within the form with such separation emphasising a different play of form which related to the instruction of 'Mass and Weight' which, 'focus the mass main pressure on the corners.'[159] The same choice of model, perspective drawing was included within the assignment drawing. Accordingly, it can also be established, the inclusion through conditions, question, problem-solving tools, method of solution, scale and deadline were provided. There appears to be close relationship between both mediums, evidence of two volumes and through the working of 'pressure on corners' of how the form should be perceived after constructed by the student. The assignment is the second of the seven to propose close working relationship between both forms of written instruction and line drawings. Through the level of detail provided between each, the line drawing still remains abstract in appearance.

Relationship between Assignment Drawing Type, Instruction and Line Drawings

Analysis of the seven assignment drawings has exposed a plethora of differences in type, instruction, line drawings which would be interpreted by the student, exposing different pedagogical functions between each. Between the assignment drawing types, are differences between each split between, 'Form', 'Space' and 'Mass and Weight', with at times repetitions of types existed. Of the above assignments, five assignments maintain the inclusion of instruction with drawings (1), (3), (5), (6), and (7), whilst the other two assignments appear to provide only drawing, exposing pedagogical differences between each – (2) and (4). The comparison between each exposes alternative types of assignment drawing instructions and line-drawings presenting different pedagogical functions and interpretations as the

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[159] Mass and Weight, February 8th, 1926, translation by author, Russian original: сосредоточить основное давление массы на углах

instructions, which would later be modelled or drawn by the student exposing the abstract

approach identified by Lamtsov as the pedagogical approach to Space learning. The

relationship with assignment drawings that provided both instruction and line drawing is

difficult to establish beyond the abstract relationship, apart from the final assignment drawing

(4) and (7), revealing the two separate pedagogical instructions were, at times, working a one

instruction. The difference pedagogically between the assignments is interesting, as there

appears no consistency or reason why certain assignments were provided with instruction and

without, exposing a 'dual' pedagogical approach in alternative forms of instruction, whilst

others without written text were abstract. The outcome, the author argues, would result in the

student receiving and interpreting the instructions differently, based on the type of assignment

received, causing interpretation by the student to become the form of understanding the

instruction.

Sequence of Assignments

The dated 'sequence' of assignment drawings (Table 4.3) exposes Lamtsov starting with a task

of 'Form', moving into 'Identification and Expression of Space' and then onto the task of

'Surface'. The assignments, however, bear little relationships with further assignment

drawings, 'Form' and 'Mass and Weight' through type exposing a random approach to the

sequence of issuing. The assignments were issued in an order of fluxuation between different

tasks and scales through different pedagogical functions of instruction. There is no consistency

or direction through the order of issue exposed causing the sequence to appear abstract

through the shift of type and the different levels of instruction to be constructed. The plethora

of differences between type, instruction, line drawings and sequence reveal a setting of

pedagogical differences which the student would interpret to be taken forward into the

forthcoming stage.

4.3.3 Stage 5–System of Visual Materials

The first stage of the second category (working process) included material pertaining to architectural history used as precedents to position the students thinking, progressing from the issued assignment drawings into a wider pedagogical context before modelling would occur (stage 8). In all chosen cases the number of examples differs per board, the five boards selected from different periods providing a wide range of precedents with a mixture of architectural and art precedents for analysis. Case III presents photographs and drawings of **architectural precedents (1400s–1500s)** from the High Renaissance, and 19 examples of historical precedents from the same period (Figure 4.11). The next board depicts a mixture of **architectural precedents (1200s–1500s)** (Figure 4.12) and contains 21 examples of historical precedents. Depicting a wide selection of **architectural and art** references, the third case study (Figure 4.13) contains 35 precedents. The fourth case study is a **board of art precedents** (Figure 4.14) and contains 8 examples of art precedents. The final case study is a board of student works for the type '**Surface'** (Figure 4.15), presenting 18 photographic examples of student's models. It differs from the other boards, providing a greater pedagogical connection with what the students were modelling as opposed to historical precedents. The five boards represent various pedagogical functions that the author aims to expose by analysing the different precedents (vol. II, section 9).

The notion of 'visual archive', a term put forward by Skansi (2015, p. 109) is relevant to the discussion of the boards; however, the term outlined by Khan-Magomedov (2007, p. 263) consisted of 'system of visual materials'. Sourced from the verso of the archival photographs stated, 'presentation boards of photographs of models, drawings, buildings, sculptures,

paintings and magazine clippings used for didactic purposes'. For the purpose of this section, the first two descriptions will be referred to at different times to avoid repetition.

The pedagogical purpose of the 'visual archive' was architectural in approach, demonstrating existing solutions and providing examples from historical architecture and other types of art. Although the boards maintained a close connection with the assignment drawings through abstract forms portrayed through the included line-drawings, the author argues that the difference in pedagogical function caused the 'visual archive' to be positioned in the 'working process' and not 'assignment' as the pedagogical function is remarkably different. The use of Code (C) (See appendix) is included to analyse the system of visual materials.

The selection of the 'visual archive' was used to shape the students minds by portraying numerous periods of architectural history and art through the 1200s–1500s to the early 20th century. The inclusion of stage 5 within the 'process' of teaching provided two working pedagogical functions simultaneously: lessons in architectural history/art and spatial analysis. The 'visual archive' became firstly a history lesson, enabling the students to position their forthcoming creation in a wider context of architectural history. The boards were also used to interpret the abstract forms found in the precedents as a means of spatial analysis through 'abstract notions' of rhythm, composition, scale, and proportion. What the teachers of Space searched for in the inclusion was its potential continuity, through timeless art and architectural concepts, 'abstract' with the languages of Space in architecture.

The first case study (Figure 4.11) portrays 'architectural examples' and represents part of the existing 'visual archive', containing images of works of architecture from different historical periods, but mainly from the 1400s and 1500s. Present was Florentine architecture (the Pazzi Chapel, Palazzo Medici-Riccardi), Palazzo Ducale in Venice, Palazzo Farnese at Caprarola and

the Basilica Palladiana, a Renaissance building in the central Piazza dei Signori in Vicenza, north-eastern Italy.[160] Included within the board were photographs of architecture in the Russian tradition, from the churches of Vladimir and Novgorod to the neoclassicism of Vasilii Ivanovic Bazenov (1738–1799).

The second case study (Figure 4.12) includes 'architectural examples' (1200s–1500s) as is used through a similar pedagogical function to the board above. Seen on the board is the Mirozhskii Monastery (1156), an architectural ensemble of tremendous historical and artistic importance; a Cathedral prototype of Byzantine architecture.[161] The Church of the Ascension (1530–1532) is also seen, combining two groups of rhythmic series in horizontal (the lower part of the structure) and vertical (upper) directions of spatial arrangement. The inclusion of the Edirne, Turkey, the Selimiye Mosque (1569-1575), also seen on the board, built by the great Ottoman architect, Sinan (1489–1588) in particular, for the proportion of the two towers in relation to the main form of the building, expressing a form of spatial relationship.

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[160] See Lowry, B. (1962), *Renaissance Architecture*, London: Prentice-Hall, pp. 41-45. See Murray, P. (1986), *Renaissance architecture*, London: Faber
[161] See Brumfield, W. (1993), *A history of Russian architecture,* Cambridge: Cambridge University Press and Berton, K. (1977), *Moscow: an architectural history*, London: Studio Vista

Figures. 4.11–4.13. 3 case studies of System of Visual Materials. (Gelatin Silver Prints). Sources: currently housed at the Canadian Centre for Architecture (CCA) and Moscow School of Architecture (MARKhI), VKhUTEMAS Collections. Archive No, top: PH1998:0014:014 – CCA, middle: PH1998:0014:011 – CCA, bottom: Кп 501-39 – MARKhI

The third case study (Figure 4.13), periods of 'architectural and art references' dates from the 14th and 15th century, during the High Renaissance (1490–1530) represents the culmination of the goals of the earlier period, namely the accurate representation of figures in space rendered with credible motion. Seen on the board is a painting by Raphael (1483-1520). Between 1510 and 1511 Raphael painted his famous fresco 'The School of Athens' (*Scuola di Atene*), which was the second mural painting to be finished for the Stanza della Segnatura and, after La Disputa, on the opposite wall.[162] The painting, a faintly curved area of Space, in the chapel on an intimate scale, is detectable in the painted background architecture of the *School of Athens*[163] where, in the barrel-vault, can be glimpsed a central area defined by statue-filled niches, with roundels in the pendentives (just as in the chapel) and a dome presumed to be above.[164] The notion of Space appears more centered towards internal Space as opposed to external compositions of Space. Differences remain in the way interpretation of internal Space is viewed as a single form, which would be perceived as an abstract form by the student. Seen on the board is the Medici, subsequently known as the Riccardi Palace (1430). The most striking example seen through the work of George Seurat (1859–1891), firstly his painting *Sunday Afternoon on the Island of La Grand Jatte* (1884–86) along with *The Circus* (1890–1891). Firstly though the first painting, Seurat achieves balance through placing three wedge shaped areas, shadow, bright sunlight, and water as diagonal swaths across the canvas exposing the spaces from front to back containing rhythm of small groupings of figures and expanses of grass. Seen through The Circus, two spaces are juxtaposed: the space for the stage and the artistes, all curves and spirals, filled with dynamic tension, or imbalance; and the space for the seating and the public, orthogonal, motionless, and strictly geometrical. Furthermore, an alternative references is seen through the inclusion of the photograph of WWI U boats,

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[162] Levey, M. (1975), *High Renaissance*, Harmondsworth: Penguin, pp. 51-53
[163] See Jones, R. and Penny, N. (1983), *Raphael*, New Haven: Yale University Press, pp. 74-75
[164] Levey, M, *High Renaissance*, p. 125

appearing out of context on face value, illustrating rhythm through the position to one another, relating in some form to the intention of spatial analysis through the intended 'abstract notions'. Furthermore, above the fresco painting appears a postcard showing Napoli through the reading of composition of the volcano present in the background, revealing an abstract form.

In the fourth example (Figure 4.14), one of Da Vinci's most famous paintings, the *Mona Lisa* (in French, *La Joconde*), is seen positioned behind a glass cabinet filled with selected examples of artistic precedents. The artistic charm of the *Mona Lisa* will not reveal itself to a casual eye. The landscape in the background is one of solely decorative charm, without any suggestion of reality or possibility. This space represents the transition between the space of the sitter and the far distance, where the landscape becomes a wild and uninhabited space of rocks and water which stretches to the horizon. The inclusion of the *Mona Lisa* beyond the transition of Space is based on the 'Golden Ratio' through a proportional relationship of composition.

The fifth case study within the 'visual archive', it is possible to identify precise architectural references of past student works (Figure 4.15), student works for the task 'Surface' (1923–1926). The board contains eighteen photographs of Students work for demonstration of 'Surface', including 'Construction of Frontal Surface Based on Vertical', 'Horizontal and Inclined Combination of Two or More Rhythmical Rows', 'Architectonic Design of the Frontal Surface', and 'Meeting Vertical Rhythmical Rows on Frontal Surface.'[165]

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[165] A selection of photographs can be established through the repository findings: from top left to bottom right: Meeting Vertical Rhythmical Rows on Frontal Surface Archive No: PH1998:0014:059, Construction of Frontal Surface Based on Vertical, Horizontal and Inclined Combination of two or More Rhythmical Rows, Archive No: PH1998:0014:077, Architectonic Design of the Frontal Surface, Archive No: PH1998:0014:142 Construction of Frontal Surface Based on Vertical, Horizontal and Inclined Combination of two or More Rhythmical Rows, Archive No: PH1998:0014:097, Architectonic Design of the Frontal Surface, Archive No: PH1998:0014:146, Construction of Frontal Surface Based on Vertical, Horizontal and Inclined Combination of two or More Rhythmical Rows Archive No: PH1998:0014:080. All photographs are currently housed at the CCA. For further examples (vol. II, section 2)
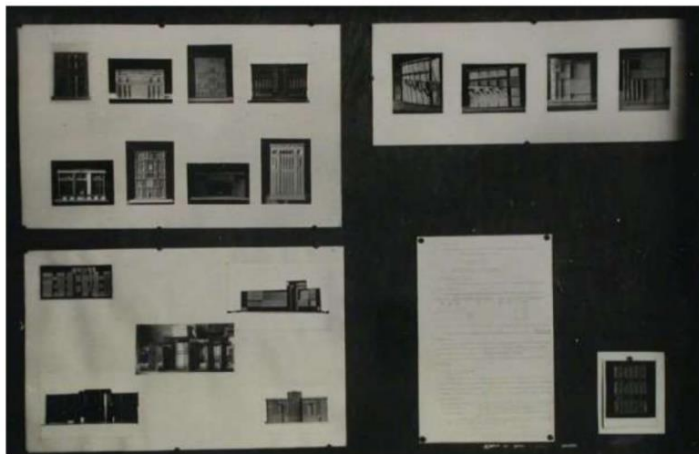
Figures. 4.14–4.15. 2 case studies of System of Visual Materials. (Gelatin Silver Prints). Sources: currently housed at the Canadian Centre for Architecture CCA, Archive No, top: PH1998:0014:013 – CCA, bottom: PH1998:0014:012

To the lower right of the boards we see an early photograph (1920) of work by Petrov for an 'abstract' OBMAS project, exposing evidence of prior pedagogical teaching through Ladovskii as reference to be constructed during Discipline Space.[166] The requirement for spatial interpretation through the final board differs from the previous boards, providing an alternative pedagogical approach were spatial interpretation came from actual examples constructed by the students, with less emphasis on boards of architectural history and art. The author argues the inclusion of student examples would contradict the purpose of stage 5

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[166] See Ladovskii*, Osnovy postroenija teorii arhitektury* [Foundations for building a theory of architecture] Proceedings of the Association of New Architects, Izvestiia ASNOVA, Moscow, pp. 3-7 for further reading of Petrovs project

allowing reference to be made towards what would be expected to be constructed restricting the abstract approach to Space learning, which would weaken the teaching process.

The multitude of precedents split between five boards provide a plethora of rich architectural, art and student examples to be interpreted through 'abstract notions' as a means to analyse the presented examples through Space, rhythm, composition and proportion. The teachers chose to mix art projects with historical references grounding Space theory, positioning it in a larger historical and pedagogical context, demonstrating the universality of the analytical approach to Space learning. The teachers chose such inclusion of material to rely on the 'virgin energy' of the students, many of whom were not only unburdened by the weight of historical knowledge, but were borderline illiterate. Forms of Illiteracy became the area of focus of the teacher, choosing to develop their students lack of architectural and spatial analysis to their advantage, using historical and art precedents in a completely different way through 'spatial composition' of volumes, rhythms, scale and proportion, rather than specifically focussing on historicised references. Combination of different precedents would 'charge' the students 'energy', encouraging interpretation of their perception of Space through abstract analysis through a plethora of architecture and art precedents.

The different course materials included in the 'process' of Space teaching helped students understand the visual devices of spatial analysis, starting with different spatial conditions; from planar space (facades, planes of High Renaissance examples) to volumetric space (the three-dimensional object), to the composition of Form. The students were required to learn from the experience of observing and analysis the precedents passing in succession from the planar view to the view in motion, all the way to the crossing of the form which they were required to develop in the following stage of modelling. The analysis learnt by the students reflects, in substance, the purpose of uniting painting, sculpture and architecture in a single formal

research to establish new forms. The boards provide spatial situations in which various disciplines of figurative art express themselves. To have analysed the precedents beyond the abstract qualities of the forms would have provided a too focussed account for spatial interpretation, deviating from the intention of stages and the abstract approach to Space learning

This stage of analysis exposes the abstract approach also seen in the previous two stages of teaching, developing the form of pedagogical interpretation using different means to teach and learn Space. It is difficult at this stage to acknowledge any clear, focussed approach to the learning of Space apart from a form of abstract interpretation. For the student wishing to continue to stage 6, no clear line of focus was provided in relation to the student's interpretation of the 'visual archive', or to what the student should model from the assignment drawing; thus the individual student's interpretation at this point formed Space learning, and became carried into the next stage of teaching.

4.3.4 Stage 6–Workshop (Lecture Hall)

Only one case study depicts the Workshop (Lecture Hall), which was sourced during the archival visit to MARKhI. The photograph shows students during an exercise in a Discipline Space lesson on the Revelation and Expression of Mass and Weight in the Workshop (Lecture Hall), 1925 (Figure 4.16). The photograph captures the close working conditions in which the students would construct their models, and depicts 15 students, many standing, and models that appear to be under construction. The workshop is full of 'Mass and Weight' models – many appearing to have been constructed of clay, offering little detail because of their 'abstract' qualities. This stage captures the conditions in which the students worked, constructing their ideas in close proximity.

Figure. 4.16. VKhUTEMAS students in the workshop of the Basic Preliminary Course, students during a Space course lesson. Exercise on the revelation of 'Mass and Weight' (1925). (Gelatin Silver Prints). Source: currently housed at the Moscow School of Architecture Museum, MARKhI, VKhUTEMAS Collection. Archive No: Unknown

The stages of pedagogy based on case IV (Figure 4.16) will be analysed using Code (A) (see appendix). The workshop (lecture hall) of the Basic Preliminary Course presented a compelling case for adapting the exacting, abstract, subjective interpretation of architecture learning as a means of allowing the students ideas to be formed as a abstract approach as seen through the prior stage of learning. The teachers created an environment that measured accuracy, spatial sensibility, spatial coordination, orientation, imagination, and ability for spatial combination in the workshop. The workshop provided an environment, enabling self-exploration through model construction where students were conditioned to learn quickly through social interaction within close working conditions; the pedagogical influence would make such a

setting important for learning and exploration, enabling former abstract learning through the prior stages to be forged into ideas of Space. Working collectively in a workshop setting, students are shown, constructing their ideas within a setting of experimentation revealing a progressive setting of examples, allowing mistakes, false-stabs, revisions and new forms of Space to occur and be corrected within one pedagogical environment. Such would have only existed as it were for the inclusion of the model, as little evidence can be sourced indicating that drawing occurred during the workshop environment at this stage. As will be seen in the rest of the analysis, the workshop is central to Space teaching (Figures 4.40, 4.41 and 4.42). The following stage, before modelling occurred, would be stage 7 Collective Discussions (I). No archival material was sourced, and no further description is provided.

4.3.5 Stage 8–Construct through Modelling

The task of the student was now to construct either through perspective drawing or modelling based on analysis of the issued assignment drawings and 'visual archive' analysis. During this section, the author has chosen to refer back to the constructed table (Table 4.17) to corroborate findings based on photographic analysis. The model type descriptions in 'red' expose the prior understanding through the words of Krinskii, with the model type descriptions in 'black' revealing the extracted descriptions from photographs stored in the repository (vol. II). The purpose of stage 8 is to expose the variational differences between the model types and the use of the medium to construct Space. The following section examines the selection of 22 cases studies based on each of the seven model types through Code B (see appendix).

Discipline Space (Models Types)
Surface (Krinskii)
1. Horizontal and Vertical Division of Surface
2. Horizontal and Vertical Division of Surface with Tone
3. Partial Division of Surface (Vertical and Horizontal, Relief and Shade)
4. Frontal Surface. Vertically Limited Rhythmical Row
5. Combination of Rhythm and Measure on Frontal Surface
6. Meeting Vertical Rhythmical Rows on Frontal Surface
7. Construction of Frontal Surface Based on Vertical, Horizontal and Inclined Combination of Two or More Rhythmical Rows
8. Design of the Frontal Surface Based on Relief and Counter-relief
9. Complex Composition Showing Combination of Texture, Material and Form of the Frontal Surface
10. Architectonic Design of the Frontal Surface
11. Combination of Rhythm and Measure on Frontal Surface
12. Complex Frontal Composition Based on Contrasting Elements
13. Frontal Composition with Spatial Elements
14. Frontal Surface with a Complex Composition of a Combination of Texture, Material and Shapes
15. Frontal Plane Based on Counter Relief
16. Complex Frontal Composition Based on Contrasting Elements
17. Frontal Plane Based on Counter Relief
Frontal Space (Author)
1. Organisation of Space over a Horizontal Surface (Rectangular, Square, Round)
2. Deep Frontal Composition
3. Complex Frontal Composition Based on Nuance and Contrast Combination of Plastic and Shade and Using Elements of Rhythm
Space and Volume (Author)
1. Constructing and Finding a Spatial Voluminous Composition Using Surface Elements
2. Voluminous Form (Cylinder) with Inclusion of Additional Elements in Space
3. Organisation of Space in a Rectangular Area
Form (Krinskii)
1. Finding the Expressiveness of Form of the Simplest Geometrical Configuration: Parallelepiped
2. Constructing and Finding a Spatial Voluminous Composition Using Surface Elements
3. Form of Blunt Massive Volume (Parallelepiped, Cylinder, Complex Configuration)
4. Organisation of Inner Space
5. Organisation of Space in a Rectilinear Area
6. Finding a Voluminous Form of set configuration (Inverted Cone)
7. Form of Blunt Massive Volume (Parallepiped Cylinder Complex configuration)
Mass and Weight (Krinskii)
1. Constructing a Voluminous Form with Finding and Expressing Mass and Weight
2. Constructing a Voluminous Composition based on correlation of mass (cube) and support
Depth-Spatial Composition (Krinskii)
1. Organisation of Space Inside a Spatial Cube
2. Deep Space with Strongly Emphasised Foreground
3. Deep Space Architectonic Composition on Circle
4. Organisation of Space on a rectilinear plane
Transformation (Author)
1. Transformation on a vertical Pane
2. Texture Transformation
3. Transformation of Tension Structure

Table. 4.17. Discipline Space models (types outlined by Krinskii and the proposed new types outlined by the author) (1923–1926). The table shows title descriptions from archival photographs exposing the wider setting for models constructed during Discipline Space. (Gelatin Silver Print) sources: currently housed at the Canadian Centre for Architecture (CCA), Moscow School of Architecture (MARKhI), Kiecken Gallery, Private Collection (I) (PC), constructed by the author based on the sourced archival photographs. Table constructed by author

The first model type (case study V, Figures 4.18-4.21); 'Surface' (outlined by Krinskii) contain a

plethora of alternative model types (the author has acknowledged 17 in total). In the works by

Khan-Magomedov and Krinskii, no mention has been made of additional models existing,

making such finds unique to the pedagogical understanding of how Space is taught and

constructed. Within the 17 types is a mixture of models with characteristics relevant to the

play between vertical and horizontal rhythm, light and shadow, and tone and relief, which are

all similar to the type 'Surface'. The selection of 4 models (case V) consists of four different

types for 'Surface'; the first example, 'Horizontal and Vertical Division of Surface' (Figure 4.18,

top left), providing evidence of tone and relief, constructed of card; the second, '**Frontal**

Surface with Finding and Correlation of Mass and Space' (Figure 4.19, top right), constructed

using clay and wire; the third, '**Frontal Surface, Vertically Limited Rhythmical Row**' (Figure

4.20, bottom left), is seen to be constructed of card; and finally, '**Frontal Surface, Vertically**

Limited Rhythmical Row' (Figure 4.21, bottom right), also constructed of card.
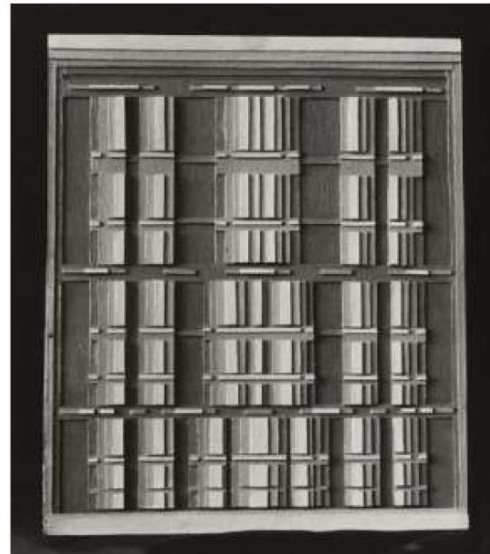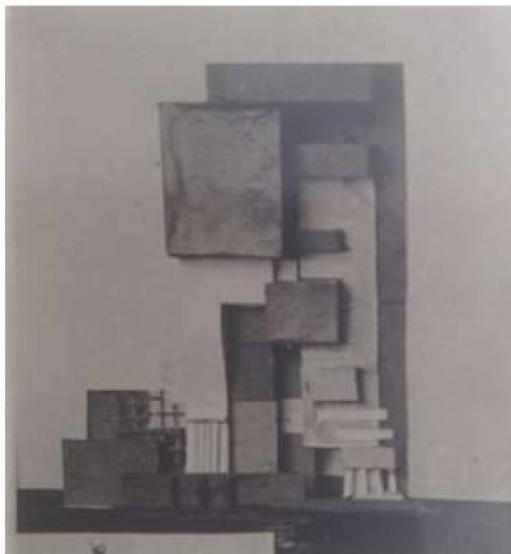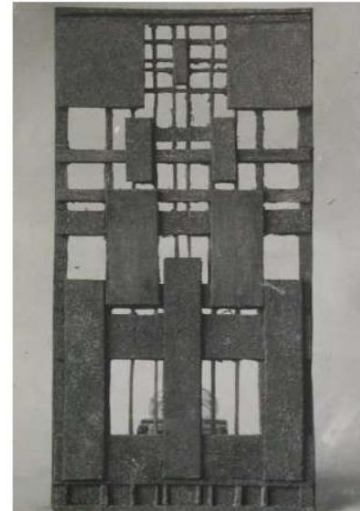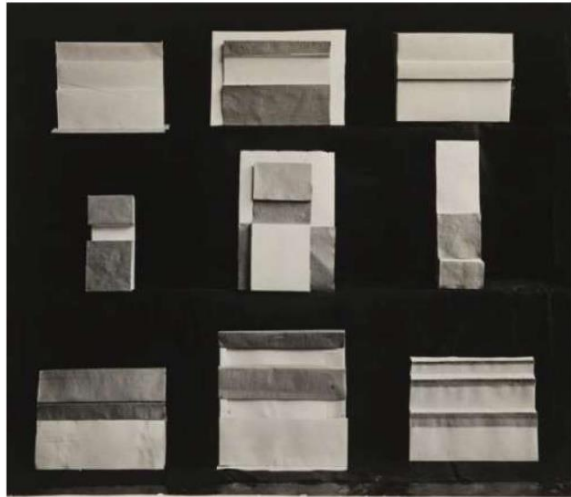
Figures. 4.18–4.21. Four models for the type 'Surface' (Gelatin Silver Prints). Sources: currently housed at the Canadian Centre for Architecture, CCA, Moscow School of Architecture, MARKhI and Private Collection (I) PC, VKhUTEMAS Collections. Archive No, top left: PH1998:0014:025 – CCA. Top right: PH1998:0014:125 – CCA. Bottom right: FUND 1968 – PC and Kn 501-214 – MARKhI. Bottom right: PH1998:0014:044 – CCA

The first model type – 'Horizontal and Vertical Division of Surface' (Figure 4.18), a selection of 9 paper models constructed by unknown authors expresses different relief and tone characteristics as a means of surface separation revealing abstract differences between each. Through the second 'Surface' type, 'Frontal Surface with Finding and Correlation of Mass and Space' (Figure 4.19), we find an alternative solution constructed from clay focussing on the inclusion of 'Mass' within the surface of the Space portrayed through a rusticated wall with

layering of interpenetration of planes on the surface of the form. The depth of penetration

portrays the mass of the form by accentuating the massiveness if its surface. The third model

type (Figure 4.20), 'Complex Front Composition based on Contrast Combinations Plastics and

Tones using elements of Rhythm', portrays a multitude of square volumes positioned within

the surface of the form expressing elements of vertical rhythm through an array of volumes.

The differences in tones express the depth of and the perception of the overall form. In the

final model, 'Frontal Surface Vertically Limited Rhythmical Row', (Figure 4.21), portrays a

surface boundary revealing separation of layered forms through increase of rhythm.

We find the Students were portraying substantial variational differences in composition, form,

material and scale, with no direct relationship between each being established apart from the

choice of material where three of the models used the material card. It is apparent the type

'Surface' served as a 'boundary' for exploration, based on the multitude of model types found.

What is now established is a selection of model variations within the new types, each

portraying the students own interpretations. It must be acknowledged that within the 17

types, exposed further pedagogical differences are found beyond the chosen case studies

which are important to acknowledge the wide trend of variations occurred (vol. II, section 2).

To have analysed through the same level of detail all 17 types to argue further the differences

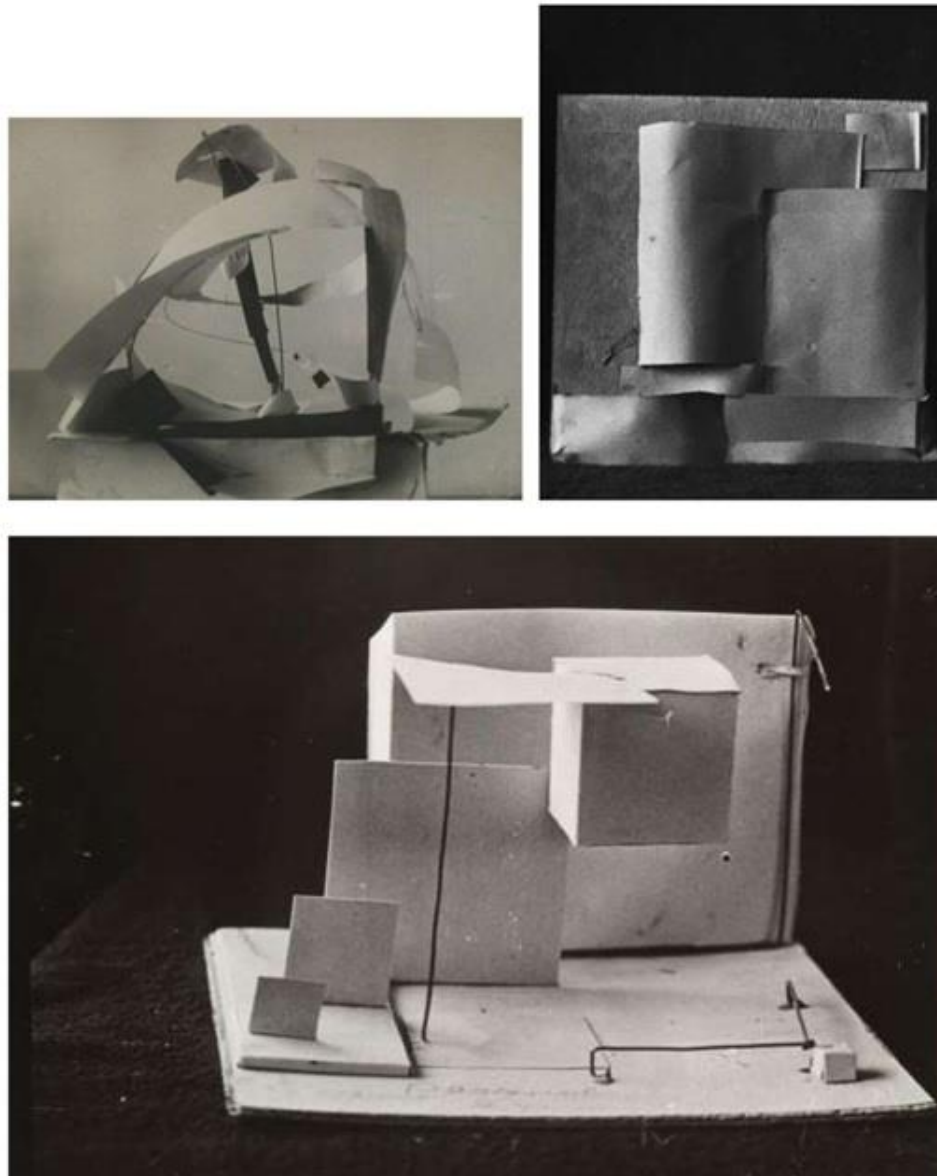between each would go beyond the scope of the research.

Figures. 4.22–4.24. 3 models for the type 'Frontal Space' (Gelatin Silver Prints). Source: currently housed at the Canadian Centre for Architecture CCA. Archive No, Top left: PH1998:0014:267 – CCA, Top right: PH1998:0014:163 – CCA, bottom: PH1998:0014:195 – CCA

We find within the second model type (case VI, Figures 4.22–4.24); 'Frontal Space' (established by the author) is new in the context of the previous four tasks outlined by Krinskii. The author found it difficult to establish any positions within the existing types causing the model types sourced to be established as a new type all together. The choice of case studies VI is focussed on the type '**Frontal Space**', the first being the model type '**Organisation of Space over a Horizontal Surface (Rectangular, Square, Round)**' (Figure 4.22, top left), constructed using

card and wire. The second model type, '**Complex Frontal Composition Based on Nuance and Contrast Combination of Plastic and Shade and Using Elements of Rhythm**' (Figure 4.23, top right), is constructed of wood and card. The third model type, '**Deep Frontal Space**' (Figure 4.24, bottom), is constructed using card and wire. The student model for 'Organisation of Space over a Horizontal Surface (Rectangular, Square, Round)' (Figure 4.22) is seen expressing and abstract form with many revolving overlapping segments creating a form of artistic gestures, framing space within. The model is powerful, characteristically portraying artistic features moving away from the intention of horizontal surface characteristics, causing the model to be a variation within the existing description. The second model in the cluster of three case studies, 'Complex Frontal Composition Based on Nuance and Contrast Combination of Plastic and Shade and Using Elements of Rhythm' (Figure 4.23), reveals a form of Surface interpretation. The characteristics of the model reveal less artistic flare, focussing more on the combinations of surface differences through choice of material of wood and card through material contrast. The simplicity of differences based on the material contrast exposes different forms; however, the notion of rhythm appears difficult to acknowledge based on the abstract interpretation by the unknown student. The final case study, 'Deep Frontal Space' (Figure 4.24), reveals compositional shifts, both vertically and horizontally within a set boundary. The horizontal plane frames the model through the multitude of surface planes increasing in size through position, exposing a form of play between horizontal and vertical rhythm. The apparent inclusion of cube appears to hover above, playing a part within the rhythm, maintaining the perception of rhythm, now removed from the plane, extended into a three dimensional form.

The difference between all three varies in terms of model relationships, all expressing similarities through material; however, different spatial characteristics and scale remain,

exposing variational ideas between each. The plethora of variations is smaller in model types

than 'Surface', however, what is revealed are model types which had no reference to the prior

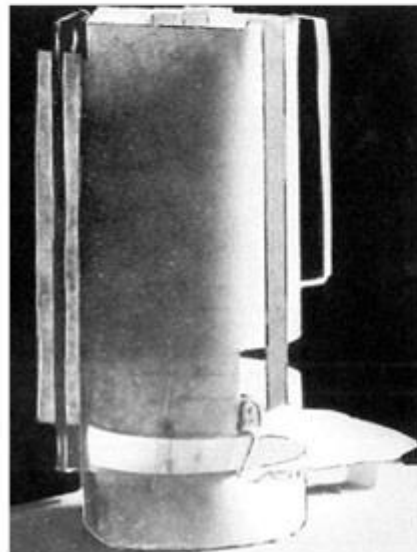understanding of Space teaching making the findings unique.

Figures. 4.25–4.27. 5 models for the type 'Space and Volume'. (Gelatin Silver Prints). Source: currently housed at the Canadian Centre for Architecture CCA. Archive No: top, PH1998:0014:218 – CCA, bottom left: PH1998:0014:257 – CCA, bottom right: PH1998:0014:253 – CCA

The third type (case VII, Figures 4.25-4.27); 'Space and Volume' (established by the author)

contains 3 types of model, the first model type is '**Constructing and Finding a Spatial**

Voluminous Composition Using Surface Elements' (Figure 4.25, top). The second model is

'**Finding a Voluminous Form (Cylinder) with Inclusion of Additional Elements in Space**' (Figure

4.26, bottom left) and finally, the third model is '**Constructing a Cubical Form Based on**

Combination of Mass and Space' (Figure 4.27, bottom right). Similar to the prior type defined

by the author, little connection can be established as to where the model types existed,

causing a further new type to be established, as no mention of it can be found in the work of

Krinskii or Khan-Magomedov. The first model – 'Constructing and Finding a Spatial Voluminous

Composition Using Surface Elements' (Figure 4.25) shows three card models each with similar

form characteristics through the inclusion of the plane. The models portray interlocking planes

which make up the geometry of the forms, revealing closed and exposed surfaces. The second

model, 'Finding a Voluminous Form (Cylinder) with Inclusion of Additional Elements in Space'

(Figure 4.26), reveals 'slits' (openings) allowing light from above to penetrate the volume

through the openings on the surface of the cylindrical form. The third model, 'Constructing a

Cubical Form Based on Combination of Mass and Space' (Figure 4.27), reveals abstract qualities

with the notion of Mass remaining present appearing through an abstractly positioned cube,

through a wired outline framing the space within. The model reveals itself as unique with very

few functional qualities revealing the abstract approach by the student based on the other two

models constructed.

Even though each model type is portrayed as part of the same type, their characteristic

differences between each case study reveal a mixed variety of models through a plethora of

forms, abstract characteristics, material and scale. The first two case examples reveal more

logical qualities of actual architecture as opposed to the abstract qualities of the final case.

These differences continue the trend of variational differences of models constructed by the
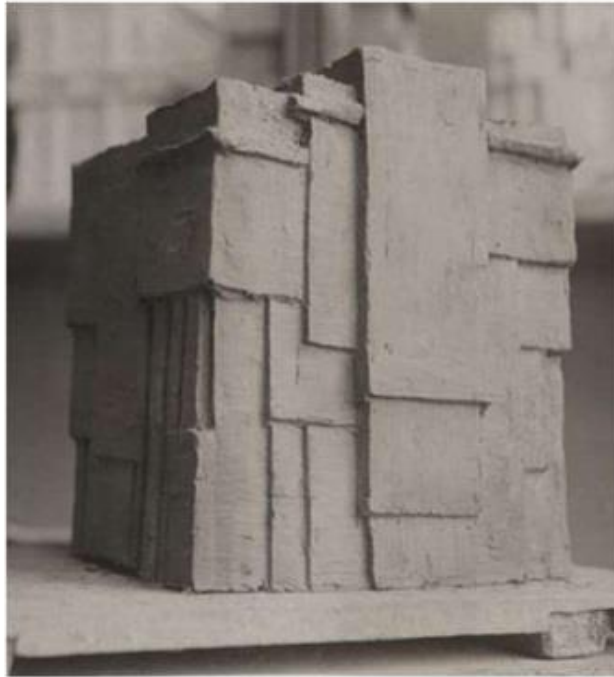
students within the same type.

Figures. 4.28–4.30. 3 models for the type 'Form' (Gelatin Silver Prints). Source: currently housed at the Canadian Centre for Architecture CCA and Moscow School of Architecture, MARKhI. Archive no. Top: PH1998:0014:226 – CCA, bottom left: Кп 501-113 –MARKhI, bottom right: PH1998:0014:205 – CCA

In the fourth type (case VIII, Figures 4.28-4.30); 'Form' (outlined by Krinskii) contains additional types have been exposed by the author. The 11 differences remain complex, as descriptions of each provide a much wider setting of model types not previously known within the academic debate. The first example of the chosen case studies, '**Finding the Form of Blunt Massive Volume (Parallelepiped, Cylinder, Complex Configuration)**', is constructed of card (Figure

4.28, top). The second example, '**Articulation of Form: Rotation of Form**', is constructed using card and paper (Figure 4.29, bottom left). The third example, '**Finding the Expressiveness of Form of the Simplest Geometrical Configuration: Parallelepiped**', is constructed using clay (Figure 4.30, bottom right). The first model within the type of 'Form is Finding the Form of Blunt Massive Volume (Parallelepiped, Cylinder, and Complex Configuration)' (Figure 4.28), reveals a single parallelepiped exposing interlocking surface characteristics through the material of clay providing separation of form through a multitude of plane extrusions, exposing the surfaces of the form. The second model, 'Articulation of Form: Rotation of Form' (Figure 4.29), portrays a cylindrical form containing different horizontal planes of separation, each connecting the other, causing each to be portrayed as one complete form. The difference in size and position causes the model to depict artistic features through size and separation of each form through a decrease in mass lower to the ground. The third model, 'Finding the Expressiveness of Form of the Simplest Geometrical Configuration: Parallelepiped' (Figure 4.30), reveals simple interlocking volumes with little surface definition, exposing 'abstract' qualities, revealing itself to portray an actual building.

Each model type is portrayed as part of the same type, their characteristic differences are apparent, causing the models to differ in both physical appearance and characteristic qualities. The relationship differs through choice of material, scale, surface characteristics and interpretation of form. A similarity between two of the models is seen, as both appear to have been constructed using clay. The first and third case reveals close logical qualities of actual buildings as opposed to the second case revealing an abstract interpretation of Form.

Figures. 4.31–4.33. 3 models for the type 'Mass and Weight' (Gelatin Silver Prints). Sources: currently housed at the Canadian Centre for Architecture CCA, Moscow School of Architecture (MARKhI), Private Collection (I) (PC). Archive No, top left: PH1998:0014:246 – CCA, top right: FUND 2164 – PC, bottom: Кп 501-221 – MARKhI

The fifth type (case IX, Figures 4.31-4.33); 'Mass and Weight', (outlined by Krinskii) contains

two alternative model types (vol. II, section 6). The choice of case studies is focussed on two

types through three examples. The first example, '**Constructing a Voluminous Composition**

Based on Correlation of Mass (Cube) and Support' (Figure 4.31, top left), is constructed using

wire and card. The second example, '**Mass and Weight**' (Figure 4.32, top right), is constructed

using clay, and finally, '**Mass and Weight**' (Figure 4.33, bottom), is also constructed of clay.

Each model photograph depicts a different type within the setting of, 'Mass and Weight',

providing a variety of student ideas. The first model, 'Constructing a Voluminous Composition

Based on Correlation of Mass (Cube) and Support' (Figure 4.31), contains an form of floating

mass connected to a sunken form through strands of vertical structure exposing how the

elevated mass is supported. The model is seen as an elaboration of the type 'Mass and

Weight', as 'Mass' is now reduced to deformation of 'Weight', using composition as the

support of Mass and for the cube to be portrayed would contradict general physics, requiring

support (Mass) to be positioned below. The model suggests both 'Mass and Weight', however,

now portrayed through artistic interpretation. The second model, 'Mass and Weight' (Figure

4.32), reveals a Parallelepiped of simple form expressing difference of surface treatment. The

deformation is rendered by means of a wedge-like displacement of shapes on the surface

concentrated in the apparent downward path of intensified gravitational force through surface

characteristics revealing the compression of Weight on Mass. The third model (Figure 4.33)

reveals an alternative form as opposed to qualities of 'Mass and Weight' through lack of

surface characteristics now containing modernist features of an actual building.

The variational differences are apparent within the model types through scale, artistic feature,

material and at times logical qualities revealing a setting of broad ideas exposing individual

interpretations of Space.
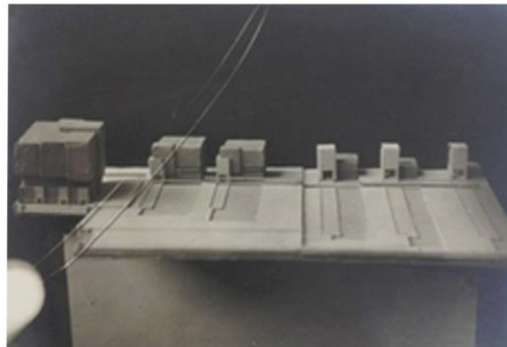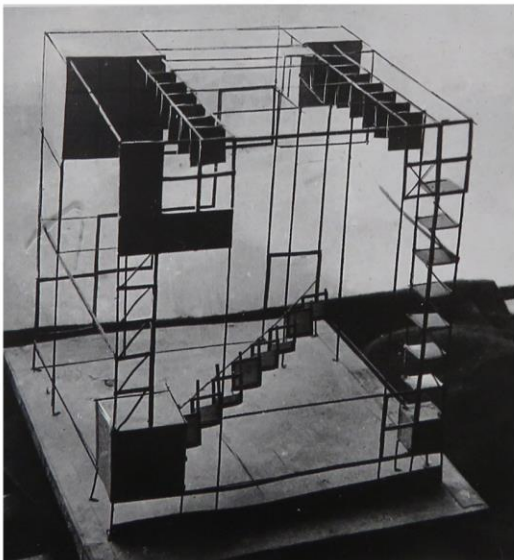
Figures. 4.34–4.36. 3 models for the type 'Deep Space' (Gelatin Silver Prints). Sources: Currently housed at the Private Collection (I) PC and the Moscow School of Architecture, MARKhI. Archive No, top: FUND 2197 – PC, bottom left: Кп 501-141 – MARKhI and bottom right: FUND 6042 – PC

The sixth type (case X, Figures 4.34-4.36); 'Depth Space Composition' (outlined by Krinskii,) no acknowledgement of further types existed beyond the type outlined by Krinskii; the repository has exposed 4 different models types (Table 4.17). The first model type being '**Architectonic composition on a rectangular plane**' (Figure 4.34, top) is constructed of clay. The second example, '**Organisation of Space inside a Cube**' (Figure 4.35, bottom left), is constructed using card and wire, and finally, '**Architectonic composition on rectangular plane**' (Figure 4.36, bottom right), is constructed using card. The first model, 'Architectonic composition on a

140

rectangular plane' (Figure 4.34), portrays a multi-layering tectonic shifts on the plane through

harmonious ratio of height, width and depth appears abstract through lack of detail beyond

surface separation. The second model, 'Organisation of Space inside a Cube' (Figure 4.35),

bears relevance to the notion of Space within Space through the inclusion of planes positioned

within the form. The model is intriguing revealing an approach to interpretation of Space

revealing abstract functions within. The final model within the category is 'Architectonic

composition on rectangular plane' (Figure 4.36), with the model expressing actual volumes

representing buildings. The model contains numerous block forms decreasing in size when

positioned further away from the primary form. The approach to such an 'abstract' task

provide an actual site to be worked by creating a confine (boundary or plane), which includes

more than one building as a proposed complex of forms. Even though each model type is

portrayed as part of the same type, their characteristic differences are apparent, causing the

models to differ in both physical appearance and characteristic qualities.

The relationship between each exposes different interpretations, split between 'abstract' and

more modernist ideas of actual buildings. The characteristics of all three model types remain

different in function, materiality and especially scale and compositional readings and

contributed to the variational differences between each. What the case studies expose is the

individual approach to Space creation revealing a progressive setting of ideas.
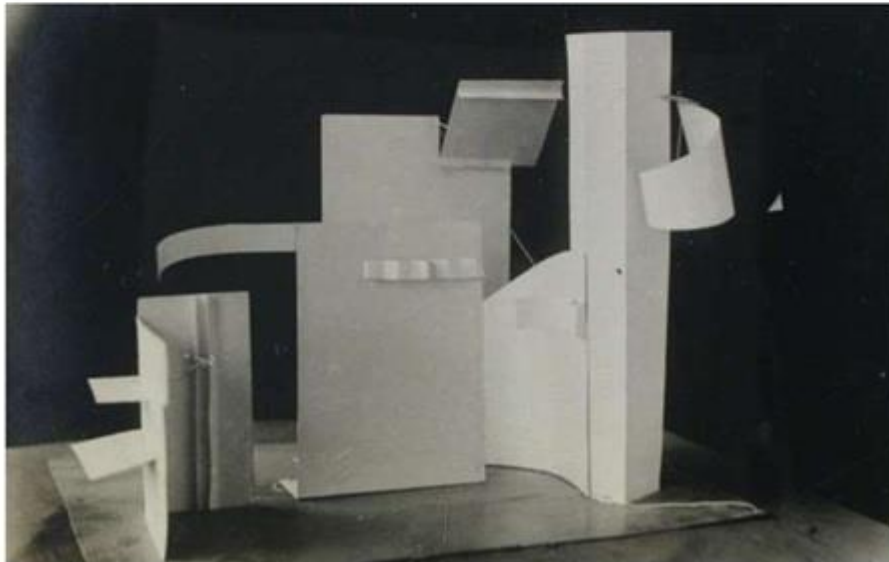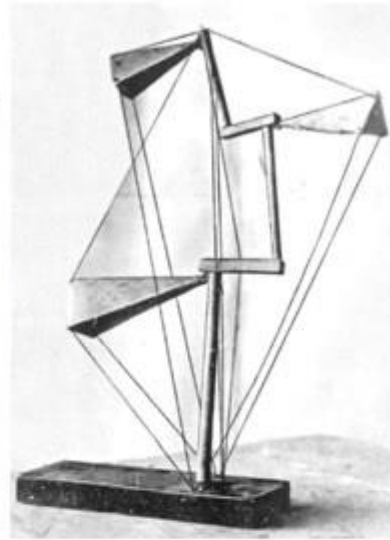
Figures. 4.37–4.39. Three models depicting the model for the type 'Transformation' (Gelatin Silver Prints). Sources: currently housed at the Canadian Centre for architecture and the Moscow School of Architecture MARKhI. Archive No, top left: PH1998:0014:332 – CCA, top right: Кп 501-66 – MARKhI and bottom: PH1998:0014:330 – CCA

The final type (case XI, Figure 4.37-4.39); 'Transformation' (established by the author), the author failed to establish any connection to the prior types, as little model relationships were identified, causing the type to be a new type within the selection of models sourced. The type 'transformation' includes 3 case studies. The first example, **Transformation of a Vertical Plane**' (Figure 4.37, top left), is constructed using card. The second example, '**Transformation of a Tension Structure**' (Figure 4.38, top right), uses wire, wood and card. Finally,

'**Transformation Exercises**' (Figure 4.39, bottom) is constructed of card. The first model,

'Transformation of a Horizontal plane in three positions' (Figure 4.37) reveals separation of

three horizontal planes positioned on the surface of the form, revealing simple vertical rhythm.

The second model, 'Transformation of Tension Structure' (Figure 4.38), reveals an alternative

form, expressing structural qualities not seen in any other models, exposing a structural aspect

in abstract form revealing three tension sections connected through a primary support. The

third model, 'Transformation' Exercises' (Figure 4.39), reveals interplay between Deep Space,

through surface position and elevated form through the material of card. The model portraying

dispositioned elements through an abstract means type.

The three cases reveal substantial differences, showing further variation differences within the

same type through material and scale, continuing the trend through the student's

interpretations once more.

Outlined in chapter 2 (Dokuchaev, 1927 pp. 6–9) states, 'The original program for the

discipline… consisted of four composition assignments: (1) Surface, (2) Mass and Weight

(volume), (3) Volumetric Composition, (4) Depth-Spatial Composition' which was the order of

construction. The 4 model types can be seen to have continued within the setting of the

findings within the repository (Table 4.17); however, there appear to have been additional

types sourced with 39 model types which the scholarly debate has overlooked. The model

types and case studies analysed, expose a vast setting of model differences to the prior

structure of models types of Krinskii. What is now exposed? Many more models types are seen

to have been constructed during the 'working process', indicating previous understanding of

the model and types during Space teaching is short-sighted and mis leading. Each of the model

types at times exposes similarities through material of card and clay appearing more

predominantly used. The variations differ through scale and composition, each reveals

interpretations of Space causing each model to be an individual interpretation by the students. As exposed in the earlier stages of Space teaching, the abstract form of learning appears to have continued into the model construction, acknowledged through the variational differences exposed. The author argues, the exposed model types reveal a vast array of alternative interpretations, contributing to the students learning of Space based on subjective interpretation through the abstract approach seen through the prior stages which the author argues allowed variational differences to be revealed.

4.3.6 Stages 9, 10, 11 and 12–Collective Discussion (ii), Collective Evaluation, Assimilate the Discipline and Development of Critical Skills

The third category (dialectic process) occurred between students and teachers through 4 stages moving the student from the second category, 'Working Processes', from model construction into the third category, whereby a form of spatial assessment would now have occur. The analysis will take place using Code (A), outlined in (see appendix); in case study Case XII (Figure 4.40).

One photograph of pedagogical significance has been sourced, which the author argues depicts four stages of teaching. It is one of the most important photographs in the collection of Discipline Space due to its unique position within the 'process' of teaching. Each stage will be discussed as one, as the author argues, based on the sourced case study, all four stages: 'Collective Discussion (ii)', 'Collective Evaluation', 'Assimilate the Discipline' and 'Development of Critical Skills' (9, 10, 11, and 12) occurred within the workshop environments. Each stage would not have been moved for continuation of discussion which depicts the teacher, Victor Balikhin, examining an unknown student's model through a form of spatial assessment before the class (Figure 4.40). This moment in Soviet teaching history, as twenty-three unknown students patiently observe as Balikhin analyses an unknown student's work, depicts a powerful

stage in the teaching of 'Space'. The shadowy model forms in the background depict roughly

forty-eight models of various types; many for the task 'Mass and Weight'; 13 of which are

delicately positioned on the top shelf.

Figure. 4.40. Victor Balikhin examining an unknown student's work (1923-1926) (Gelatin Silver Print). Sources: currently housed at the Archive of A. V. Shchusev State Museum of Architecture MUAR. Archive No: Unknown

After modelling is completed, the first stage within the 'Dialectic Process' would consist of

stage 9, 'Collective Discussions (ii)'. The author argues this stage would take place immediately

after stage 8 still within the workshop setting. Through a form of 'Collective Evaluation', stage

10, this moment in Space teaching history of the 'collective evaluation' depicts a powerful

stage in the teaching of Discipline Space – the open examination of a student's model and consisted of developing the art of investigating discussing opinions between students holding different points of view to establish 'truth' through reasoned arguments of ideas just created. The creation of Space based on the student's interpretation along with the teacher would provide a rich setting of pedagogical learning, witnessing a number of different solutions for the same task, enriched their knowledge and experience, encouraging a broader approach to the interpretation based on the open evaluation. This stage exposes a pedagogical shift in which the teacher would perform Collective Evaluation (Stage 10) on behalf of the student through a form of open spatial assessment. The noticeable differences in the student models – material and scale – portray a mixture of models and demonstrations exposed that have existed earlier. The evaluation by Balikhin provided an alternative perspective on the student's models through the plethora of sizes and scales on show. The workshop setting is central for the 'collective evaluation', framing the importance of a workshop (lecture hall), not just for constructing ideas through the model, but included evaluation from the perspective of the teacher and students.

Through the third stage of teaching 'Assimilate the Discipline' (Stage 11), the outcome of the prior evaluation allowed the students to reframe their perception of Space learning based on the 'Collective Discussion (ii)' and 'Collective Evaluations' discussed previously. This allowed for reflective observations and assimilation, resulting in widening the students understanding in a collective format and setting based on the discussions which has taken place. The student would see other model solutions previously assessed allowing the assimilation of what Space was meant to be and the alternative possibilities found constructed. This form of learning remained central to the learning of Space, allowing the students to see a wide variety of model solutions exposing problems that fellow students may have found difficult to understand.

The apparent inclusion of the 'collective discussions (ii)', 'collective evaluation' and 'assimilation' based on fellow student models would enable the 'development of critical skills' (Stage 12). Pedagogically this provided a shift of learning, using the teacher's and student's interpretation as the form of learning. This stage allowed the students to take forward earlier discussions to fully understand the critique of the modelling and the discussions that had taken place. At the end of the discussions and evaluation the student would have enhanced skills of Space from the critique of their model construction. Following the final category, Evaluation and Conclusion' Stage 13, the 'Correction of Shortcomings', Stage 14, 'Commission's Examination and Assessment', and Stage 15, and 'Improve Mark' would follow. The author argues based on the number of 'terms' and 'concepts' established that 'Mark is Given' and the results would be written in the 'Special Protocol' would occur within stage 14 as they bear close similarities through pedagogical function. As no archival material was sourced, no further description is provided.

4.3.7 Stage 16–Exhibition of Student Works

The final stage of analysis within the 'process' of teaching is stage 16, 'Exhibition of Student Works' case XIII (Figures 4.41, top and 4.42, bottom). The photographs depict two exhibitions of different model types constructed of clay and card. Through the first case study, there appears to be a mixture of sixty three model types from 'Mass and Weight', 'Form' and 'Deep Frontal Composition' present, exposing a wide setting of model differences through scale type and material. In the first case study (Figure 4.41) a workshop full of 'Mass and Weight' models can be seen. The photograph was taken inside the workshop, which contains eighty five models, many made of clay offering very little detail in their 'abstract' forms (Figure 4.42). There are ten students in the photograph, many of whom are standing, waiting for their work

to be photographed. The student, second left at the bottom, can be found in a separate

photograph (vol. II, section 6). The shelving to the rear of the room can be seen to contain

simple lettering, depicting the studio assignment category, indicating where the models would

be placed after completion. Attached are the letters A and B, depicting the page of the

assignment which would be modelled. The case studies will be the final photographs to be

used within the analysis to expose the concluding stages of the analysis of Discipline Space

pedagogy. The analysis will take place using Code (D) (see appendix). The justification for the

choice of case studies enabled the argument of the abstract approach to the teaching of Space

to be captured through both settings.

The role and purpose of the exhibition is central to Space teaching allowing the best student

works to be exhibited to enable other students to see the variety of solutions. The exhibition is

important for the students' learning as it allowed for subjective interpretations of the creation

of Space within the setting of the workshop where the student ideas were forged. Based on the

wide setting of model types constructed by the students now exposed, what the author argues,

the exhibition captured how Space is taught using the models as evidence of the freedom of

exploration through the plethora of model types and the differences between each. The wide

setting of model types provided precedents for students to examine how past students not

only constructed Space, but how they interpreted it, exposing the endless possibilities that

could be achieved.
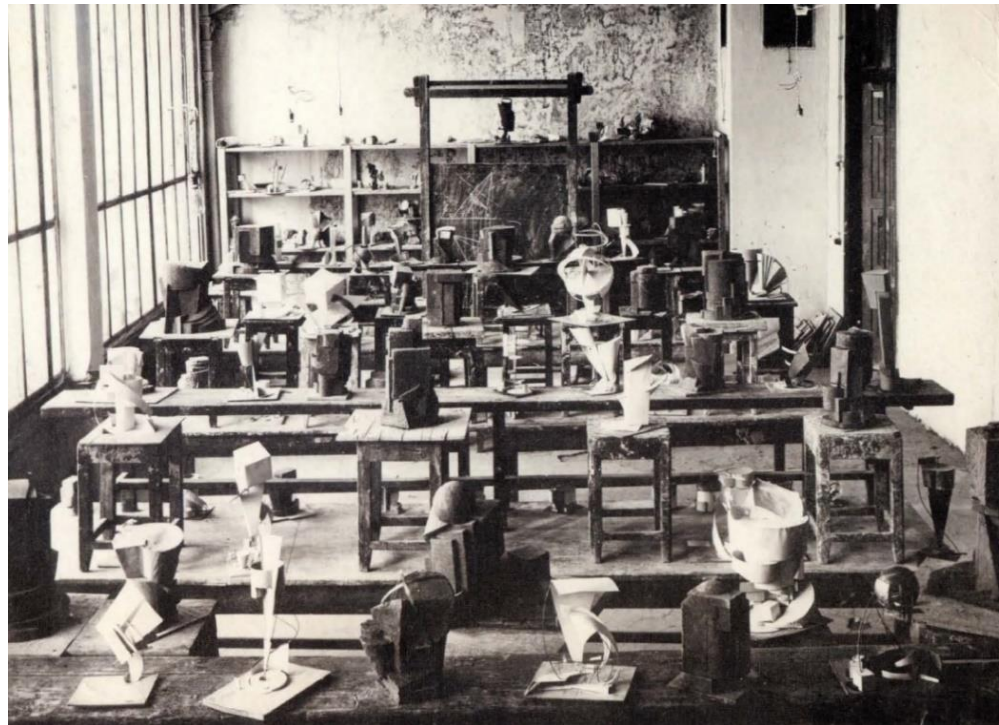
Figures. 4.41–4.42. Exhibition of Students work depicting a plethora of model themes (1923–1926) (Gelatin Silver Prints). Sources: currently housed at the Moscow School of Architecture, MARKhI. Archive No, top: Кп 501-016 – MARKhI, bottom: Кп 501-017 – MARKhI

The multitude of model types exposed, reveal a setting of variational differences through type, scale and material exposing the interpretation by the students. Acknowledged through the models on 'Mass and Weight' (Figure 4.4.1), the argument of variations is more apparent exposing a plethora of differences through surface characteristics, mass, material (clay) and scale through a single model type.

The exhibition would serve as a means of celebrating the best students' work, whilst also providing illustrative examples from which other students would learn. The author argues the exhibitions captured the end approach to Space learning, exposing the variations of model and abstract approach to Space teaching. Furthering the realm of Space creation through student interpretation would allow the teachers to see the different interpretations and learn from what had been constructed. The final stage of Space teaching would consist of stage 17 'concluding interview' where past task would be discussed.

4.4 Discipline Space Assessment

This section now assesses the pedagogical findings of the three areas of teaching outlined in the overall Discipline Space teaching which has been portrayed and analysed. The following section will be discussed in 6 areas: (1) process assessment, (2) sequence assessment, (3) model-format assessment, (4) relationships between stages of teaching, (5) students learning of Discipline Space, and (6) Discipline Space teaching.

4.4.1 Process Assessment

The focused approach by the author portrays how Discipline Space is taught as a 'process' of teaching and learning and can be assessed as a multi-pedagogical function enabling students to construct Space through a progressive abstract form of learning. The constructed diagram

(pull-out I) illustrates pedagogically how the 'process' of Discipline Space is taught, functioning as one entire sophisticated 'process' split between 4 categories and 17 stages. This provided a robust and rhythmical form of pedagogy, each stage influencing the next in a sequenced manner until the process became complete. The separation of categories allowed the teaching to be divided appropriately for different pedagogical functions, each evolving the students learning in a multitude of structured phases.

The assignment drawings (stage 4) occurring within the first category of teaching (which will be addressed in the next section as a single focus) were constructed and issued by Lamtsov provided a form of instruction with numerous pedagogical functions occurring within each, which the student would interpret as instructions.

Inclusion of the 'visual archives' (stage 5) is closely associated with the assignment drawings, even though portrayed in the second category 'working process' creating an abstract relationship with the line-drawings established by Lamtsov through abstract forms. The wealth of historical examples used for spatial analysis purposes legitimise the otherwise 'abstract' form-generation and formalist approach to architecture' by 'appropriating architectural heritage.' The boards served as both a launching pad and running reference for the students before modelling would commence with analysis to be taken forward into the workshop and model construction stage.

The workshop remained a central environment within the teaching of Discipline Space allowing the student's ideas to be forged. The many model types, reveal a much wider setting of interpretation by the students revealing an abstract approach to the students' own interpretation of what they felt Space was through the use of the model. The author argues, through the stages of teaching and its abstract approach, exposes a progressive setting of

Space learning. The students' interpretation of Space becoming evaluated through the third

category was important to the process of teaching provide the necessary open discussions and

evaluation to further investigate of Space. The re-occurring abstractions, as each stage of

analysis found, provided different pedagogical functions, which the author argues had a

domino effect at each stage of learning, which became transferred into the next. The transfer

was not always direct revealing the process of Space learning to have become taught

abstractly.

4.4.2 Sequence Assessment

Analysis of Cases I and II (Figure 4.4 -4.10), reveal multiple differences in the instructions for

each assignment for which Lamtsov at times provided full instructions in both written text and

drawing. Lamtsov chose to remove text at times, causing the entry into the project for the

student to be provided solely in the line drawing issued. Lamtsov can be seen to have provided

five assignments with instructions in both text and drawing, while the remaining two had

instructions in the form of drawing only, requiring the student, to interpret what was to be

constructed using the line-drawings only as the instruction. This, the author argues, was a

pedagogical choice by Lamtsov. The justification for such abstract form of instruction remained

only to 'guide' the student forward, not to provide any solid form of instruction, reinforcing the

notion of an abstract form of learning. What has been sourced exposes alternative 'sequence'

that demonstrate that at no point during the teaching of Discipline Space did the sequence of

assignments remain a static entity, providing a plethora of additional/modified and different

pedagogical intentions between each, causing the 'sequence' to portray an abstract approach

to Space learning.

4.4.3 Model-Format Assessment

The focus on the use of the model, as opposed to drawings is revealed, indicating that the

model was the primary medium for construction of Space. The model used as the primary

medium in the 'working process' allowed their students' to describe ideas in physical form,

exploring such ideas through a plethora of material, composition and scale. The model

remained central to teaching and learning, as without it, the students would have perceived

Space in the wrong format. The role of the model was to introduce students, on the one hand,

to the expression of form, and on the other, to rethink form when placed in relation to space,

namely, in the moment for the student to think spatially and to construct Space. The students

were obliged to make 'leaps' into the unknown, providing an interpretation of what they felt

Space was meant to be. The model types exposed within the chosen case studies and

repository provide a separate context of Space learning, as little acknowledgement can be

found within the scholarly debate for such models to have existed within each type beyond the

acknowledged four types by Krinskii. What has been revealed based on the new types is very

little relationship between each is established, furthering the differences exposed through

student interpretation. These substantial findings provide a much welcomed understanding of

how the abstract approach to Space impacted the students learning through the inclusion of

the model.

4.4.4 Relationships between Stages of Teaching

As a means to corroborate if the teaching of Space is taught as intended, the author chose to

establish a comparison between two stages, (4) and (8). The author carried out a comparative

analysis, firstly through the chosen case studies between the assignment drawings and model

types (Figures 4.4-4.10 and 4.18-4.39). The descriptions of assignment drawing types and

model type at times do reveal similarities, however, through visual analysis; no relationship can be established between instruction, line drawing and sequence to what was constructed by the students. What this reveals is that the intention of the instruction was never modelled as intended exposing the abstract function of the assignment drawings and the importance of the student's subjective interpretation within the learning of Space through the model types constructed through the lack of connections to previous stages.

The author chose to broaden the comparison to the whole of the repository between both assignment drawings and model photographs (vol. II, section 1 and section 2-8). No further relationship could be revealed. What this exposes is the specifically established assignment drawing as an instruction was not followed as intended, justifying the previous analysis findings of an abstract form of teaching and learning. Based on the stages of teaching and how they are taught, one would expect through the lack of connections more model types to have existed through the now exposed Space teaching.

4.4.5 Students Learning of Space

It has been established through the research findings that stages of disconnectivity were present through set pedagogical functions of individual stages; however, the author argues these forms of disconnectivity provided the core aspect of the students learning of Space. The workshop is central to students developing their ideas within an environment designed for such use. Without a specific environment would have made the construction and ideas through model making much more difficult. Based on the now clear understanding of how Space teaching is taught through the forms of disconnectivity in the stages analysed and exposing an understanding why so many models existed is central to the understanding of students learning of Space. The exposed model types provide evidence of an abstract approach to Space

creation through the lack of direct relationship to the intended instruction issued. Apart from venturing into the unknown through subjective interpretation, the justification for why the additional model types constructed depends on the students understanding of Space and their interpretation of what they felt Space was meant to be. Accordingly, the discussions established after the construction of models reveal further learning to further the approach to Space teaching through spatial analysis. The stage of 'exhibition of students work' reveal the creative thinking and development based on the process having gone through, framing the abstract teaching of Space learning. This allowed students to see a multitude of different creations of Space.

4.4.6 Discipline Space Teaching

The position of Discipline Space as a preliminary level of architectural teaching set within the setting of the Basic Preliminary Course provided the necessary setting for a wide body of students to be taught the fundamentals of architectural teaching in a short space of time. The real task of teaching Space was, in fact, much more ambitious than just a new method of pedagogy. Even though the 'process' focussed on 'abstract' assignments and models at the elementary level of architecture, the 'process' of how it is taught was anything but 'abstract.' The aspiration of the teachers remained pedagogical in focus providing students with a highly reliable means for solving architectural problems through the medium of the model through an abstract approach. Although created for an elementary level of architectural pedagogy, the relationship between the different stages and the overall function of how it is taught was sophisticated; based on the 4 categories and 17 stages exposing forms of abstract connectivity and disconnectivity, which worked towards the overall pedagogical function of an abstract form of Space learning. The abstract connections and disconnectivity exposed between the

categories and stages of teaching opened the way for the student's own interpretation to portray how they would perceive Space. This in turn, would result in new forms being created, exposing a unique pedagogical function as no relationship can be established between both assignment drawing and model types. The abstract approach caused the student to interpret what Space was meant to be, making the form of teaching a powerful tool for architectural learning. It is a case of curious inversion, in which the subjects of Discipline Space, the students, became principal agents and experts in defining the architectural form through model construction. Through the abstract learning which, the author argues the plethora of model types exposed, the students became 'test subjects' as a means to develop further what Space was to be.

For the student to have constructed what was asked through the level of instruction, the simplicity and disconnectivity of instruction to the line-drawings, the outcome would have been prescriptive. The lack of direct instruction and the inclusion of the model made possible a new spatial vision and conception of dynamic architectural pedagogy that was distinguished by an impressive vitality and depth of creative possibilities. It demonstrated persuasively that abstract learning and richness, handled with discipline and control are not antithetical to the conceptual ideals of classical pedagogy, which remained vital for Space teaching and learning.

4.5 Summary of Chapter

This chapter has reviewed the approaches and teaching methods of Discipline Space through the three areas of pedagogy as one experience based on the sourced and chosen case studies. The first section looked at general introduction to case studies, setting forth the analysis, which related to individual stages of the process. The second section portrayed in running order the teaching of Discipline Space through ten stages through analysis based on the selected archival

material. The overall teaching provided a progressive setting of abstract learning that forced the students to interpret what Space meant through the medium of the model, which remained the primary entry into the construction of Space.

The chapter finished by discussing Discipline Space assessment through 6 areas; firstly, through each area of teaching, then through the relationships between stages of pedagogy, the model and the students learning of Space. The relationships that have been made show the multitude of works between the three areas, exposing the fragmented pedagogical workings that made Space teaching and learning unique for its time. The results of Discipline Space teaching have exposed the inner working, highlighting core pedagogical functions that made the pedagogy experimental, through abstract learning.

Chapter V

Discussions

5.1 Introduction

The research aims consisted of portraying how the subject of Discipline Space is taught, which has now allowed for detailed comparisons between the two pedagogical settings (1921–1923 to 1923–1926). This chapter outlines the comparison between Ladovskii's theory/pedagogy and the results of analysis through assessment of the way Discipline Space is taught, as acknowledged in the previous chapter. In terms of pedagogical similarities, the lack of a coherent understanding of Discipline Space was obvious; however, to further the pedagogical understanding through comparisons will expose pedagogical similarities and differences that, in turn, the author argues have defined Discipline Space teaching.

5.2 Ladovskii's Theory/Pedagogy and Discipline Space (1921–1923/1923–1926)

The teachings of Ladovskii, Dokuchaev and Krinskii were secluded within the walls of VKhUTEMAS in the studio (OBMAS) and taught to a select number of students, restricting its pedagogical reach over its three-year period. The development of the new educational approach through the three areas of teaching developed by Ladovskii (as outlined by Khan-Magomedov) established a new form of architectural teaching, rejecting the stance on classical traditions and providing a new form of architectural learning. Central to the way the two other areas were be taught, the 'process' was the first of the three areas to be established, creating a

pedagogical structure providing a short and quick approach to architectural teaching. The second area, 'sequence' through the inclusion of a new form of instruction (assignment drawing) was central to the learning using a prescribed medium that allowed the instruction to be issued to Ladovskii's students. The third area was 'model-format'; however, through graphical evidence, it has been established that the drawing was the primary medium of choice used to construct Space by the students of Ladovskii; the model having been used only briefly. The inclusion of 'Expressive Qualities' was central to Ladovskii's teaching exposing the students learning outcomes. All areas of teaching and the inclusion of 'Expressive Qualities' made Ladovskii's early teaching unique for its time and a form of teaching and learning without precedent.

The teaching of Discipline Space became a much broader form of architectural learning, designed for mass teaching in an established pedagogical setting (workshop) within the Basic Preliminary Course. The teaching developed an alternative approach to Ladovskii's, moving towards abstract learning through a multitude of pedagogical categories and stages with a focus on the model for spatial learning. Each of the three areas developed by Ladovskii continued to be taught within Discipline Space. The difference between each area of teaching aims differed, based on the position and stages of development within the setting of VKhUTEMAS. In comparison with Ladovskii's teaching and based on the research findings, deeper, abstract pedagogical functions were established, which were central for Discipline Space teaching and learning.

5.3 Process Discussion

The first area of comparison (process) developed by Ladovskii, taught between 1921 and 1923, allowed his theory and pedagogy to be delivered in a short, controlled manner in 2 categories,

'abstract' and 'production', taught in nine stages, split between each category (Table 1.2). The author's interpretation of the research findings (chapter 5) reveal that the 'process' of Discipline Space (section 4.3 and Table 4.1) – based on the 'terms' and 'concepts', 'solid' archival research and the three areas of teaching – consisted of 4 categories of separate pedagogical functions, split between 17 stages.

Process Connections

Of the 2 categories and 9 stages of Ladovskii's teaching, only a selection of stages were taught during Discipline Space (process) through all of 4 stages; namely, 'assignment issued', 'explanation of task', 'drawing (abstract tasks)' and 'evaluation'. The first stage that appears was 'assignment issued', occurring during stage 1. The research has revealed that this stage is taught at stage 4 (assignments issued) during Discipline Space, exposing a shift of stage position. The second stage, 'explanation of task', taught at stage 4 of Discipline Space, exposes a further shift of position. The third stage 'drawing/modelling (abstract tasks)' is the first appearance of such modelling and appears during stage 8 through Discipline Space, which is dedicated to model construction. The drawing, seen in both 'abstract' and 'production' tasks during OBMAS, did not continue to be used as a 'tool' for constructing Space during Discipline Space, as the repository shows that students would construct in the model, without first preparing a drawing (a further comparison will take place in the model-format discussion), providing justification that the new stage was being taught with a focus on model education. The final stage of transfer between both processes is 'evaluation', appearing at stage 4 during Ladovskii's teaching; however, the evaluation during Discipline Space occurred later in the fourth and final category of 'evaluation and conclusion', which contained 5 stages (Table 4.1). No mention can be found of the 'single' stage of evaluation having been taught within

Discipline Space, only that it is taught within a wider setting of evaluations under a single category.

The stages taught between each setting, even though appearing in different positions, expose pedagogical similarities. The connections established reveal 'small' connections which, the author argues, were a factor in the establishment of Discipline Space as a means for mass teaching. To have started without a form of 'process' reference, the transfer of stages, even though small and fragmentally positioned would have deterred the development of the 'process' of Discipline Space. This made the 'process' of Ladovskii important for identifying how Discipline Space is taught.

Process Differences

The 4 categories and 17 stages based on the author's findings through the 'terms' and 'concepts', archival research process of teaching at times are new in terms of Ladovskii's 'process' (Table 4.1). The four categories, each a separation of individual pedagogical functions, framed the approach of how Discipline Space is taught before individual stages were taught. The first category 'assignment' focussed on the beginning of the process, setting out the introduction and instructions. The second 'working process' allowed for construction of the instruction. The third 'dialectic process' focussed on the assessment of the constructed models; and finally, the fourth established the evaluation of the process. The inclusion of the 4 categories established reveal few similarities to the categories of 'abstract' and 'production', exposing immediate pedagogical differences of overall function on a wider scale between each.

The following section, based on the established four stages of Ladovskii's teaching and the continuation within Discipline Space, now addresses the 13 individual stages, which differed from Ladovskii's previous teaching. The first stage of difference, the inclusion of 'introductory lecture and program content' (stage 1) within the first category, focussed on a larger number

of students, as it is taught to the entire class as opposed to a select few. The second stage of difference (stage 2) consisted of 'organising equipment' and exposed greater focus on the mediums to be constructed. The additional two stages already revealed expose the first category as having contained 4 stages, based on the two already existing, which were similar to Ladovskii's. The first category provided a focussed introduction, exposing the greater 'thrust' necessary for mass teaching to allow momentum to be carried into the next category. The apparent difference within the second category (stage 5), exposes an alternative stage not previously seen within Ladovskii's 'process' being 'system of visual materials', taught through spatial analysis through 'abstract notions' of proportion, scale and rhythm. The 'visual archive', even though a single additional stage, altered the dynamic of the pedagogical approach to Space teaching, which differed from Ladovskii as no prior inclusion can be established. The 'workshop (lecture hall)' (stage 6) is different within the 'process' of Discipline Space (which appears also in stages 9–12 and 16), established as a learning environment for the purpose of model construction and Space assessment, which was not a specific focus of Ladovskii as the model was not the primary medium of construction. The next, stage 7, 'Collective Discussions (i)', is the first of two discussions, exposing a focussed approach through verbal discussion before modelling would commence. Stage 8, 'construct through modelling', the final stage within the second category focussed solely on the model construction. As the repository findings suggest, the model is the primary medium for constructing Space. Each stage within the second category is new in comparison to Ladovskii's teaching, revealing different pedagogical approaches through the workshop and model focus. The third category of differences consisted of 4 stages of new pedagogical functions; no reference can be established showing that the stages were taught during Ladovskii 'process'. The first, (stage 9), is seen as a continuation from stage 7, whereby a second discussion would take place after the

162

modelling had been completed. Each of the remaining stages focussed on evaluations during group discussions in the workshop setting, which was unique to the learning of Space through spatial assessment, providing a new pedagogical dynamic for both teachers and students. The focus on the concluding stages (stages 13–17) in the final category exposes the pedagogical focus on concluding the 'process'. As outlined above, the evaluation is taught in one stage by Ladovskii; however, as established through the research findings, the 'process' of Discipline Space provides more focus on how the 'process' would conclude through 5 additional stages.

The categories and stages of Discipline Space differed from Ladovskii's 'process' resulting in a new and extended form of learning, which the author argues was necessary for the 'wider' approach to architectural learning during the Basic Preliminary Course whose purpose was to teach the masses as opposed to a select few students. The continuation of four stages of Ladovskii 'process' was evident within Discipline Space; however, his two categories 'abstract' and 'production' were excluded. The difference between the categories in comparison with the 4 categories of Discipline Space exposes more focussed disparities of pedagogical aims that framed the varying pedagogical functions of each category providing a more coherent structure of learning and making the 'process' considerably unlike Ladovskii's shorter approach.

The comparisons expose 'pockets' of pedagogical differences between the 4 categories and the new 13 stages. The author argues that the transfer of stages (outlined above) became necessary (if only briefly) for starting Discipline Space 'process', allowing additional stages to be included for mass teaching and causing the additional 13 stages, split between the 4 categories, to be established for a new form of teaching. The pedagogical difference between each 'process' exposes different approaches to Space learning, with Ladovskii's teaching being developed for the purpose of quick succession. The evidence provides more established forms

of pedagogy within Discipline Space with a focus on mass pedagogy through the workshop, with the primary focus on the model. The sophistication of the 'process' of Discipline Space depicted a rhythmical process, excluding anything resembling a stop and start 'process', for which the teaching and learning served as a vehicle for venturing into the unknown through model education. The newly developed learning was unique, and a necessary method for teaching the never previously seen large diverse body of students. The author argues that it would have been difficult to maintain Ladovskii's 'process' with the new, larger influx of students during the Basic Preliminary Course at VKhUTEMAS as it was too short to be used for mass teaching. If the process had remained unchanged, the approach would have caused the pedagogy to be too restricted, including fewer stages, thus impacting the students learning and inevitably affecting pedagogical output.

5.4 Sequence Discussion

The second area of teaching (sequence) developed by Ladovskii through both 'abstract' and 'production' assignments relied heavily on a set of prescribed operations and very basic step-by-step written instructions that were given to students in the form of assignments. These would be repeated one after the other in close succession with the final assignment concluding the learning of Space. The assignments were designed in such a way that the students would acquire the correct spatial knowledge in a sequence to reach the final stage, which Ladovskii called Space. Comparisons between both 'sequences' will take place between connections and differences through the following areas: (1) assignment drawing type, (2) instruction, (3) line drawing, (4) relationship between instruction, (5) Space theory, and (6) sequence (Table 1.3 and 4.3).

Assignment Drawing Type Connections

Only three assignment drawings issued by Lamtsov (based on the seven case studies chosen) bear similarities to Ladovskii's assignment drawings, i.e., 'Mass and Weight' established as assignment drawings 5, 6 and 7 through the sequence of Lamtsov.

Assignment Drawing Type Differences

Within the 7 assignment drawings issued by Lamtsov, 4 were different from Ladovskii; the first being 'Form', January 18th, 1924, as the pedagogical difference (based on the author's past analysis) causes the first assignment (through the inclusion of cylindrical elements) to be portrayed differently compared with Ladovskii's first assignment drawing, expressing small differences (geometrical properties of form) that now appeared cylindrical.

The second assignment drawing, Space 1924/1925, is new in terms of Ladovskii's 7 assignments, as the author argues, combined the three final tasks of Ladovskii's sequence (five, six and seven) (Table 1.3) in similarities of scale, as no references can be established that the final three tasks of Ladovskii were taught during Discipline Space. The third assignment, 'Surface', November 24th, 1924, is new within the assignment setting as no reference can be established confirming that the assignment was taught by Ladovskii, making such a discovery important by establishing pedagogical differences between each setting. The fourth assignment, Form, January 2nd, 1925, provided an alternative approach with the inclusion of additional elements of form evolving from the single geometrical form (which was Ladovskii's first assignment drawing); Lamtsov having issued two assignments of the same type, no reference can be established that Ladovskii issued two abstract assignment drawings for the same task.

Instruction Connections

Ladovskii's 6 instructions (seen in his assignments) were taught using the same method during Discipline Space through selected assignment drawings by Lamtsov. The analysis and assessment (see section 4.3.2) reveal a multitude of differences. Sourced within the issued assignments of Lamtsov, the 6 instructions developed by Ladovskii, in 5 of the 7 assignments, the same instruction remained; i.e., 'Form': January 18th, 1924, 'Surface': November 24th, 1924, Form: January 2nd, 1925, 'Mass and Weight': February 8th, 1926, 'Mass and Weight': February 8th, 1926; revealing a pedagogical approach similar to Ladovskii's.

Instruction Differences

Two remaining assignment drawings: Space 1924/1925 and 'Mass and Weight' March 2nd, 1925 provided no written instruction. The author argues this was a separate pedagogical function, designed by Lamtsov, to leave out such text, as the students would have had to interpret the lack of text as a form of instruction, with the line drawing becoming the instruction. The lack of written instruction may appear small pedagogically; however, it was an important learning function; and within the 'sequence' that differed from Ladovskii's instruction.

Line Drawing Connections

Like the five assignment drawings that continued Ladovskii's 6 instructions, each was similar in format in the inclusion of line-drawings. The connection of formats between each shifted between two-line-drawings in both section/elevation and plan to, at times, a mixture of four drawings, providing further levels of instruction. As above, these differences may seem small; however, it was a difference that the students would have to interpret. Beyond the connections established little differences through the inclusion of the line drawings can be seen.

Space Theory

Ladovskii's method of assignment drawings contained small amounts of theory through spatial instruction. Evidence found from the analysis of Lamtsov, which provided text, did not continue Ladovskii's inclusion of theory resulting in depiction of an abstract assignment for an abstract task in an abstract format that the student had to interpret. The absence of theory is quite revealing; the assignments portraying an abstract solution exposing considerable freedom for the instruction to be constructed by the student. The author argues that it was the aim of Lamtsov to reduce the level of instruction, encouraging the student's interpretation it, rather than simply following an instruction. The reason for this, the author argues, is the lack of inclusion of Space theory in a similar structure of 'Expressive Qualities' and 'motifs', which has not been exposed within Discipline Space teaching, causing the learning to be abstract and revealing a different pedagogical approach.

Relationship between Instruction/Line Drawings and Space Theory

Ladovskii's format provided instruction in both instruction and line drawing to function as a 'solid' form of instruction, each relating to the other, justifying why both were used. There were, at times, forms of disconnectivity within Lamtsov's assignment drawings that contained both instruction and line-drawings, as the relationship between the drawing and instruction did not align, a clear example being 'Mass and Weight', February 8th 1926, as Lamtsov did not provide separation of 'Form' in the drawing. This made it difficult to establish how Weight would compress on the Mass as the text suggests something other than what is portrayed in the drawing. The author argues that this would remain a further pedagogical function, requiring abstract interpretation of instruction and the lack of relationship between both text/drawing and the exclusion of Space theory. The student would have to interpret further the disconnectivity between each in order to create Space.

Sequence Connections

Comparison will now take place between the 7 abstract tasks of Ladovskii in the context of the 7 case studies of Lamtsov. The sequence of the 14 assignments established by Ladovskii provided for a complete rounded architecture student, split between both 'abstract' and 'production' (Table 1.3). As a means of providing a form of Space learning with each task impacting the next, all stages of sequence would be included in the final task thus completing the sequence of Space teaching. The only connection of assignment drawings of Lamtsov with the 'sequence' of Ladovskii was Form, January 18th 1924, being the first assignment drawing by date; however, in the assignment differences and different interpretations exposed above, this connection is only at face value, based on the description of the assignments, and nothing more.

Sequence Differences

In Lamtsov's second assignment (Space, 1924/1925), based on similarities to Ladovskii's final three assignments, a shift of position of pedagogical learning from position 5-7 to position 2 appears. Lamtsov's third assignment drawing (Surface, November 24th 1924) was not mentioned by Ladovskii, exposing a new position and assignment drawings all together. The author argues it would have been more applicable for the assignment drawing of 'Surface' to have taken place before constructing 'Form', allowing the student to focus on surface characteristics first as an individual assignment that would have then been transferred onto the surface of the 'Form', and not the other way around. Lamtsov exposes a alternative form of learning in a different sequence. The fourth assignment (Form, January 2nd 1925) is similar to the first assignment; however, after analysis, it bears little connection to the first assignment because additional elements are exposed in the drawings. There is no evidence within Ladovskii's prior 'sequence' that a second assignment on 'Form' is taught, making the

repetition of assignment drawing new within the sequence set by Lamtsov and altering the sequence of Ladovskii. Seen as the final 3 tasks by Ladovskii (based on the dates attached to each, 1925/1926), the three assignment drawings for 'Mass and Weight' by Lamtsov were positioned at stages 5, 6 and 7 within the Discipline Space sequence. Ladovskii's position of 'Mass and Weight' occurred at stage 3 and 4, exposing further differences of sequence.

The assignment drawing, a 'tool' devised by Ladovskii, was taught in a similar form during Discipline Space; however, the interpretation of the level of assignment drawing type, instruction, format, Space theory and sequence was different, exposing Lamtsov's alternative pedagogical approaches. It has been revealed that 4 of Ladovskii's assignments were not taught by Lamtsov: (1) revelation of the physical-mechanical attributes of form – mass and stability, mass and balance; (2) revelation of construction revelation of dynamics; (3) revelation of Space; (4) rhythm, relationships and proportions – on a vertical axis exposing further pedagogical differences. The exclusion of Ladovskii's assignment drawings and sequence resulted in a different approach to Space learning, revealing a focussed emphasis on 'Mass and Weight' and 'Form' with only a single assignment for 'Surface' and 'Space'. Lamtsov's sequence, compared with that of Ladovskii was shorter and fragmented, which the author argues was incorrect, providing a less structured approach to Space learning. The scale of proposed tasks (some of individual form, surface and large-scale proposals), based on the order of issuing, exposes 'leaps' between each assignment drawing, exposing a different and experimental 'sequence' of learning.

If Ladovskii's sequence of assignments is classified as Space from its inception up to 1923, can the now exposed 'sequence' of Discipline Space be classified as Space as outlined by Lamtsov? The author argues not. Even through interpretation based on a selection of assignment drawings, the sequence was too 'abstract' and misplaced. For Lamtsov's sequence to be

portrayed as Space it would have had to be followed as originally intended, but there is no progressive sequence, which was central to Ladovskii's teaching. Such consistency cannot be found in Lamtsov's order of assignments, as a fragmented sequence has been established, exposing an abstract form of learning in which there is no relationship between the assignment drawings and no logical sequence from commencement to conclusion of the learning of Space, thus no set learning output is established.

5.5 Model-Format Discussion

The third area of pedagogy (model-format) developed by Ladovskii was split between two and three dimensions through both drawing and modelling, which became the students choice of construction, based on the instructions provided. Constructing through the medium of the drawing, the author argues would contradict Ladovskii's theory of the perception of Space, as it was difficult to perceive Space in two dimensions. At times, the model is found to be used through a selection of examples portrayed. As seen in the previous two areas of learning, the lack of 'production' stages and 'production' assignment drawings would continue through the lack of 'production' models found within the repository of Discipline Space. Because of this, the section now carries out a comparison, exposing the medium differences and the extent of use of the model between each solely though 'abstract' models (see section 1.6.3 and Figure 4.41)

Model Types Connections

It is the author's understanding, both drawing and modelling occurred during the teaching and learning during OBMAS. To establish direct connections between both settings is difficult beyond the acknowledgement of the mediums chosen to construct Space; however, it is important to emphasize that the model did appear during Ladovskii teaching, exposing a connection to the inclusion of the model during Discipline Space, even if only briefly.

Model Type Differences

The 39 model types revealed in the repository categorisation in comparison to the brief use of the model through OBAMS exposes a much wider setting of the inclusion of the abstract models during Discipline Space, providing evidence of an important shift of medium constructed by the students. Based on prior analysis, it was the student's choice to construct models, as both drawing and models were options issued within Lamtsov's instructions. Exposure of the model used during Discipline Space reveals a deeper approach to learning, with a plethora of different model types between each, revealing the importance of the model in Discipline Space learning.

5.6 Teaching the Masses and the Impact on Space Learning

The number of students in each setting between 1921–1923 and 1923–1926 was fundamentally different (see chapter 2). Ladovskii's pedagogy occurred within the walls of VKhUTEMAS in the newly established OBMAS. Shielded from external influences during the development of rationalist theory and pedagogy, it was developed during a three-year inception period. The mass shift of teaching in 1923 with the inclusion of the Basic Preliminary Course influenced the way Discipline Space widened its pedagogical approach, by adding new categories and stages of teaching to serve a wider body of students. The mass shift opened up the opportunity for pedagogical changes to be implemented by the teachers by devising a new and extended form of learning, which the author argues became a discipline for its time for the purpose it was meant to serve. The teaching of the subject highlighted a much needed response to the requirement to educate the masses of students who, in turn, held a key position for continuing and evolving Space though subjective interpretation.

5.7 Space Theory in the context of Space Teaching and Learning

The established 'Expressive Qualities' and 'architectural motifs' devised by Ladovskii during OBMAS was central to his pedagogical teaching and learning and was important for establishing connections between all three areas of teaching, working as one pedagogical function. The inclusion of Ladovskii's theory, which was central to the success of the student's learning output, provided a structured approach that allowed the 'Expressive Qualities' and 'motifs' to be readily transferred for inclusion in the students interpretations of Space.

The research findings have exposed a lack of prior theory of 'Expressive Qualities' and 'motifs' through a similar approach to Space teaching within Discipline Space. No research evidence established by the author has uncovered the 4 types of 'Expressive Qualities' taught during Discipline Space, especially through the assignment drawings analysis. The absence of theory allowed the outcome of the students learning to be framed differently according to prior intentions and abstract interpretation. Without theory, the students were obliged to adopt an abstract approach to Discipline Space learning, and little evidence has been found to indicate that the students learning was monitored, despite the apparent absence of theory and change in the way students had previously been taught. The author argues that this contributed to a form of pedagogical overarching, providing the students with more freedom to learn through abstract subjective interpretation, contrary to Ladovskii's structured approach.

5.8 Use of the Model on Students Space Learning

While both drawing and modelling (which was provided as an option for the students through Ladovskii's assignment drawing) were available to enable students to learn, more emphasis was placed on drawing as the chosen medium. The author argues that this would have

'restricted' the student's interpretation of their work, as they would have been unable to perceive Space correctly in two dimensions.

The research findings have established that the most innovative pedagogical method used during Discipline Space was designing directly in model form (chosen by the student). Constructing the model would further the disconnectivity from a two-dimensional assignment drawing to a three-dimensional model, altering the student's learning outcome. The model was used as the primary medium, which provided the opportunity for individual interpretations, allowing students to take a 'leap into the unknown'. When starting to create a model, students were not aware of its eventual form; the result was formed as part of the process of creating. The method used in Discipline Space challenged students to think spatially, working directly in three dimensions and providing a new realm of learning. The choice of constructing a model caused problems for the students (which, the author argues, was a pedagogical function), based on the shift and disconnectivity between mediums of assignment drawings and models, which led to new model types being created.

5.9 The Impact of the Model on how Space is taught

The exclusion of a focussed use of the model in Ladovskii's teaching impacted on the way the three areas were taught, causing less stages to be included shortening the teaching, restricting the pedagogical approach and function overall, all of which was the aim of Ladovskii in his 'controlled' learning approach. This produced set learning outputs.

The material shift to designing directly with the model, the author argues, impacted the 'process' of teaching Discipline Space considerably by reducing the need for the traditional pin up, which was replaced with a focus on the workshop environment. In the newly-formed 4 categories and 13 new stages taught during Discipline Space, the author argues the second and

third category 'working process' and 'dialectic process' (stage 6, 8, 9, 10, 11 and 12) were

included, based on the inclusion of the model, with its evident presence within the category's

and stages. In the second category, (workshop – lecture hall, stage 6), the focus was on how

the models would be constructed, as no evidence can be found that a similar focus existed

during Ladovskii's teaching, as the model was not the primary medium of construction. The

'working process' was introduced via creation of the model, which required a set category of

teaching. The multitude of models reveals progressive pedagogical characteristics, exposing an

important pedagogical element within Discipline Space pedagogy, thus revealing an element of

self-interpretation. The author argues within the third category, stages 9, 10, 11, and 12, in

which the model was central to the open discussions, introducing a new level of human

interaction in the workshops, revealing an alternative form of teaching which did not appear to

be taught during Ladovskii's process. Through the shift of teaching and the inclusion of the

model as the primary means of constructing Space, it would have been difficult to openly

examine a two-dimensional drawing when the learning evolved around the concept of Space,

making the inclusion of the model central to the way Discipline Space is taught. The model was

'central' to the success of the teaching of Space and for providing a robust approach to

learning which impacted how Space is taught.

5.10 The Outcome of Students Learning of Space

Ladovskii's theory and pedagogy was taught through a very strict and focussed approach,

producing set outputs of learning based on the established areas of teaching. Students were at

times constructing in two dimensions. This made Space learning difficult to perceive through

false interpretations of Space through the inclusion of constructing through the drawing. The

inclusion of 'Expressive Qualities' and architectural 'motifs' contributed to the teaching

practice and the established areas of pedagogy, providing the necessary approach for teaching and developing a new form of architectural instruction. Based on Ladovskii's theory relating to the economy of psychic energy, the key word here, 'economy', caused the focus to remain on the tasks and theory, allowing for little deviation. The outcome of students learning of Space was controlled, each area of pedagogy operating together to enable the learning output to be achieved.

Comparison of the three areas of Ladovskii's teaching has demonstrated an alternative form of learning in Discipline Space, with no clear structure based on devised forms of disconnectivity. The difference in assignment drawing type, instruction, line drawings, Space theory, and sequence, the author argues, altered the form of pedagogy resulting in alternative abstract forms of instruction being taught, encouraging students to interpret Space, which the author argues was Lamtsov's intention. The pedagogical approach including historical references in the 'system of visual materials' provides a 'new' and 'broader' means of Space learning, influencing the student's perception of what was to be constructed based on spatial interpretation appertaining to 'abstract notions' not seen through Ladovskii's teaching. The outcome of inclusion of the model and additional stages furthered the approach to learning, which required the student's interpretation to form part of the learning process. Furthermore, the model played an important part, requiring the student's subjective interpretation to be demonstrated, impacting on the way students learnt Space. The workshop designed for the purpose of model construction helped the students learning, framed within an environment that allowed the students ideas to be forged. The subject was simple and clever, making the students responsible for their own learning and creation of Space, encouraging them to use their individual interpretations of Space, which explains why so many model types were found to have been constructed found within the repository.

5.11 Summary of Chapter

This chapter has reviewed the approaches and methods of Ladovskii's theory and pedagogy in the three areas of Discipline Space based on the findings established in chapter five. The systematic evaluation of Ladovskii's pedagogy and characteristics of Discipline Space teaching were useful in clarifying the most important pedagogical characteristics within that setting. The first section looked at the process and explored the differences between both, revealing a 'small' transfer of 4 stages and the inclusion of 4 new categories containing 13 new stages. The newly formed 'process' discovered ways to teach hundreds of students from diverse backgrounds and was a purposely developed abstract form of pedagogy to serve the masses. The second compared the 'sequences', exposing the differences between assignment drawing type, instruction, formats, Space theory, and sequence, revealing a plethora of different pedagogical functions. The findings showed little consistency in Lamtsov's teaching, which broke Ladovskii's sequence set, providing an alternative form of Space learning. The third section, 'model-format', exposed a wide variety of model types in comparison with the select few constructed during Ladovskii's teaching. The fundamental difference between each setting exposes the different forms of learning, each influenced from different positions within VKhUTEMAS. Ladovskii's theory and pedagogy not only helped to reveal these distinctions, but also offered a new methodological approach, enabling the systematic assessment of Discipline Space taking into consideration the changes in pedagogy for mass teaching and the inclusion of the model as the primary medium for constructing Space. Detailed investigation revealed the dynamic link between the three areas as although based on different pedagogical functions in an extended form of pedagogy required for mass teaching, all are seen to have been taught during Discipline Space.

Chapter VI

Conclusion

This research has portrayed how Discipline Space is taught along with a detailed comparison between Ladovskii's theory/pedagogy and Discipline Space, exposing 'pockets' of core pedagogical findings. The author will now describe each 'pocket' as identified by the author in relation to the research questions established at the beginning of the thesis. The chapter will be discussed in 4 areas: (1) findings of the study, (2) significance and contribution of study, (3) applicability of conceptual framework and Space methodology, and finally (4) wider relevance and future research. This chapter firstly summarises the findings of the research and reflects on its implications for the study in relation to the research questions. The second covers the significance and contribution of the study and the findings. Thirdly, the applicability of conceptual framework and Space methodology design is discussed to establish their importance within the research and their contribution to the research findings. This is followed by the acknowledgement of wider relevance and future research to conclude the study.

6.1 Findings of the Study

The research findings do not advocate imitation of pedagogical understanding of Discipline Space, but a positive interpretation of the abstract pedagogy and the way it is taught, giving students an approach with which to establish subjective learning in a new pedagogical environment (workshop) for mass teaching, with a focus on the use of the model as a means to construct Space.

It was in the newly-formed pedagogical environment of Discipline Space that the results of a

new architectural teaching would be effectively transmitted to those who would constitute the

coming generation of architects, thereby providing reasonable assurance that they would be

trained to implement new design methodology in a way calculated through an abstract

approach of architectural learning. The formation of the Basic Preliminary Course and

Government reform was important for the development of the pedagogy of Discipline Space,

serving the wider influx of mass students through an elementary form of architectural learning.

The new categories and multitude of new stages provided the setting for the teaching of

Discipline Space, containing numerous layers of disconnectivity and resulting in the teaching

being taught using an abstract approach. Even though the process of teaching focussed on

abstraction, the process including how it is taught was anything but abstract. The forms of

disconnectivity found between stages of teaching required the student to interpret Space

subjectively, resulting in the yet to be established model types evolving through a form of

experimental understanding in a rhythmical process of abstract learning. The results of which

caused a form of experimental learning that was central to the pedagogical output, which the

author argues was the cornerstone of Discipline Space teaching.

The three areas of pedagogy developed by Ladovskii are each seen to have continued during

Discipline Space learning; however, each area was extended for the purpose of mass teaching

and caused differences within each to be established. The 'process' included four previous

stages of transfer, which the author argues set the scene for the development of a 'new' and

much wider 'process' being established. A much more focussed 'process' has been established,

split between 4 categories and 17 stages, 13 of which are new to the teaching and learning of

Discipline Space. The continuation of the assignment drawings (sequence) devised by Ladovskii

helped the transfer of instruction to be continued during Discipline Space. Through the

different pedagogical aims within the 'sequence' established by Lamtsov, each assignment

drawing portrayed similarities and differences that the author argues impacted on the students

learning through different layers of pedagogical functions that the student would have to

interpret as the means of instruction rather than an instruction to follow. The absence of

theory within the assignment drawings caused the pedagogy of Discipline Space to be abstract,

which in turn caused subjective interpretation to be the primary pedagogical function. It is the

author's view that Lamtsov's 'sequence' weakened the students learning, as no complete or

coherent sequence of learning is taught, impacting on the way Discipline Space would be learnt

through mis positioning, scaling of tasks and, more importantly, the order in which the student

would progress, resulting in a 'fragmented' form of learning.

The 'model-format' is central to the teaching of Discipline Space, the options set by Lamtsov

within his assignment drawings, required the students to prepare either drawings or models to

construct Space, revealing a 'choice' of either medium. The author argues that the students

decision to design with models strengthened the students learning, encouraging them to

perceive Space in three dimensions, furthering the disconnection between earlier stages of

two-dimensional assignment drawing and shifting the model to creation of a less coherent

structure of learning, causing the student to take a 'leap' into the unknown as the form of

learning.

The mass shift impacted considerably on the way Discipline Space is taught, allowing the three

areas of pedagogy to be extended and modified for the purpose of mass learning, including

necessary additions with a focus on abstraction. The shift from select students to mass

teaching allowed different pedagogical functions to be implemented, providing an opportunity,

through the inception of the Basic Preliminary course, for the teachers of Discipline Space to

expand the pedagogy through a mass perspective, requiring additional categories and stages. The abstract learning and mass approach, broadened the pedagogy and included new stages of teaching, such as stage 5 which, the author argues, impacted the process, using timeless architecture and art as precedents as a form of spatial analysis. The workshop (stage 6) was established allowing the mass students to construct Space in an environment established for model construction and assessment. The output following inclusion of additional stages of teaching and the focus on the workshop with inclusion of the model was central to the way Discipline Space is taught, providing an environment where learning could be developed in a controlled setting. It was remarkable how teachers of Discipline Space when focussing on three areas of teaching could take students from the outskirts of Moscow, many illiterate and from peasant backgrounds, and on the very first day begin to teach them the basic fundamental elements of architecture. Discipline Space developed as a true architectural discipline as the earlier teaching of Ladovskii would not have withstood the increased number of students, thus explaining why the three areas of pedagogy were extended in response to the influence of the mass shift in Discipline Space teaching and learning.

The model was a powerful 'tool' in the teaching of Discipline Space and is seen to have had a considerable impact along with model types constructed by the students, providing evidence of its role and functional use. Without the students' choice of the model for constructing Space, new findings would not have existed in the model types exposed, as the drawing would have restricted the development of the students learning, encouraging them to perceive Space in the wrong medium, resulting in fewer 'leaps' of learning because the model raised issues for the students of Discipline Space to resolve. The model became important in perceiving Space which inevitably caused problems for the students which was its pedagogical function; however, the intention was to turn those problems into solutions or newly formed creations of

Space. If drawing was to be constructed this the author argues would have caused less model differences exposed through the types within the repository findings. The use of the model in the students learning further became established based on the additional stages of pedagogy which the author argues became included because of the model which in turn impacted the students learning based on the additional categories and stages established.

Outlined in the title of the thesis, 'Teaching Discipline Space: Experimental Architectural Pedagogy', Discipline Space did in fact become experimental in terms of its pedagogical attributes through the lack of coherent structure and absence of a clear learning outcome. At no point did the pedagogy of Discipline Space remain a static entity with the plethora of differences at each category and stage providing an abstract approach to architectural learning. The subject's significance lay not only in pedagogy, but also in generating a new spatial and visual language through the model as the form of learning; instrumental for the emergence of modern architecture from a mass perspective.

6.2 Significance and Contribution of Study

This research is the first to identify and access archival assignment drawings, models, system of visual materials, workshop and exhibition photographs more than any other existing scholarship on Discipline Space together with a pedagogical focus to portray how the subject is taught. Despite criticism of the quantitative methods for subjective matters, this study has adopted a positivistic view and contributes to the field regarding the pedagogical assessment of Discipline Space. The research is particularly important in the context of the Soviet Union and has contributed to the development of Soviet pedagogical studies from a rigid archival perspective. The characteristics of Discipline Space and its transformation process have been studied by area. The areas, which were deeply rooted in the pedagogy of Ladovskii, as outlined

by Khan-Magomedov, have been defined according to a set of pedagogical characteristics at different stages of teaching, which all worked together to reflect the essence of Discipline Space for the mass body of students taught through the shift of the model. The approach for portraying how Discipline Space is taught has allowed the perspective and understanding of the mass shift to be more readily understood, enabling the pedagogical understanding to be achieved.

In contrast with other studies that mainly identify the historical factors affecting Discipline Space, this research has particularly stressed its pedagogical dimensions and contributed to the lesser volume of literature through an archival perspective, identifying the potential impact of the pedagogical characteristics of Space teaching. Therefore, previous research has not profoundly revealed the real contribution to Discipline Space learning and the pedagogical factors affecting Discipline Space. The research has strengthened the focus on pedagogical understanding with the integration of Ladovskii's theory/ pedagogical analysis and comparison, allowing 'core' function of Discipline Space to be exposed. Although this is just a first tentative exploration of one aspect of Discipline Space, the results suggest many avenues for further research in this direction; for instance, cross comparisons with the three other disciplines of the Basic Preliminary Course (Graphics, Colour and Volume) and the impact the other disciplines had on Discipline Space teaching.

6.3 Applicability of the Conceptual [Framework] and Space Methodology Design

The theoretical background behind the conceptual framework is founded on a detailed review of Discipline Space literature, archival research and Ladovskii's theory/pedagogy in the three areas to provide a bridge between each to portray how Discipline Space is taught. The focus of the 'terms' and 'concepts', archival research and the three areas of pedagogy devised by

Ladovskii, introduced a conceptual framework providing a multidimensional view of Discipline

Space assessment, exposing further pedagogical connections not covered in an existing

scholarship. This framework offers a new way to define Discipline Space. Apart from the

methodological approach, the proposed multi-dimensional Space methodology is novel for the

pedagogical assessment of Discipline Space. It is a comprehensive approach that can be

effectively used, particularly in historical research with archival material. It is in its current form

appropriate to the Soviet History and pedagogy, as the archival focus can be applied to other

studies should a similar amount of archival material exist.

6.4 Wider Relevance and Future Research

In order to further the research now would be an appropriate time to digitise the repository of

Discipline Space assignment drawings, models, system of visual materials, workshop and

exhibition photographs collected over the duration of the thesis, as this has never before been

attempted. Such a proposal would open up the opportunity to collaborate with existing

archives, institutions and private collectors, creating one complete digital collection to

contribute to the history of VKhUTEMAS and the schools teaching methods, enabling this

extraordinary period of Soviet pedagogy to be positioned within the public domain.

This research was conducted with a medium sample size and its scope was limited to the

pedagogical context; in particular, to Discipline Space. To test its reliability, future research

could use a larger sample size and extend it to different forms of pedagogy within VKhUTEMAS.

If alternative case studies were to be used in a similar methodological approach, then the

outcome would produce new understanding of the teaching of Discipline Space.

Another approach would be to test the pedagogy of Space teaching in today's world, and this is

the author's ambition when the research is complete. Ladovskii's theory, or the very first

stages of its development, will be 100 years old in 2021. The opportunity to celebrate this rich architectural pedagogy and Soviet history of VKhUTEMAS with an exhibition is the author's future aim.

The remaining collection (Tosca fund) for which access was not granted during the archival stage is a weak point in the repository, and there are dangers through interpretations in the absence of this material. Whether it contains only photographs or assignments drawings also is unknown. To include the unknown collection would have offered a different dynamic to the repository, furthering the understanding of alternative archival material. As this material is unfortunately in private hands, there is the real possibility that it may have been sold separately in small amounts to private collectors. This will make it ever more difficult to locate the entire collection, but there is always the hope that a new private collector may be open to sharing their collection when they are sourced.

Finally, the possible connections in parallel with the architecture school Bauhaus, through the theory/pedagogy of Discipline Space teaching, is open. Although outside the scope of this study (as acknowledged in the scope of the research), further research to include the Bauhaus will remain important to enable 'solid' connections and future findings to be established using a similar archival approach.

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Chapter 4

Figure. 4.2. Krinskii with students and Korzhev (left, in checked shirt) with Turkus (wearing tie) discussing assignments. Source: Museum of the Moscow Institute of Architecture (MARKhI) Moscow, VKhUTEMAS Collection

Figures. 4.4–4.6. Selection of three Assignment Drawings. Source: Khan-Magomedov, (1990), Russian edition pp. 249-251, Khan-Magomedov, (1990), French edition, p. 520, Khan-Magomedov, (1995), pp. 66-81 and Khan-Magomedov, (2007), pp. 266-272

Figures. 4.7–4.10. Selection of four Assignment Drawings (Gelatin Silver Prints). Source: Museum of the Moscow Institute of Architecture (MARKhI) Moscow, VKhUTEMAS Collection

Figures. 4.11–4.13. Selection of three System of Visual Materials (Gelatine Silver Prints). Source: Canadian Center for Architecture (CCA) Canada, VKhUTEMAS Collection

Figures. 4.14–4.15. 2 case studies of System of Visual Materials (Gelatin Silver Prints). Sources: currently housed at the Canadian Centre for Architecture CCA

Figure. 4.16. VKhUTEMAS students during a Space course lesson. Exercise on the revelation of 'Mass and Weight' (1925) (Gelatin Silver Print). Source: Museum of the Moscow Institute of Architecture (MARKhI) Moscow, VKhUTEMAS Collection

Figures. 4.18–4.21. A selection of models for the model type 'Surface' (Gelatin Silver Prints). Source: Private Collector, London, VKhUTEMAS Collection Canadian Center for Architecture (CCA) Canada, VKhUTEMAS Collection and Museum of the Moscow Institute of Architecture (MARKhI) Moscow, VKhUTEMAS Collection

Figures. 4.22–4.24. A selection of models for the model type 'Frontal Space' (Gelatin Silver Prints). Source: Private Collector, London, VKhUTEMAS Collection, Canadian Center for Architecture (CCA) Canada, VKhUTEMAS Collection Museum of the Moscow Institute of Architecture (MARKhI) Moscow, VKhUTEMAS Collection

Figures. 4.25–4.27. A selection of models for the model type 'Space and Volume' (Gelatin Silver Prints). Source: Private Collector, London, VKhUTEMAS Collection, Canadian Center for Architecture (CCA) Canada, VKhUTEMAS Collection and Museum of the Moscow Institute of Architecture (MARKhI) Moscow, VKhUTEMAS Collection

Figures. 4.28–4.30. A Selection of Models for the model type 'Form' (Gelatin Silver Prints). Source: Private Collector, London, VKhUTEMAS Collection, Canadian Center for Architecture (CCA) Canada, VKhUTEMAS Collection and Museum of the Moscow Institute of Architecture (MARKhI) Moscow, VKhUTEMAS Collection

Figures. 4.31–4.33. A Selection of models for the model type 'Mass and Weight' (Gelatin Silver Prints). Source: Private Collector, London, VKhUTEMAS Collection, Canadian Center for Architecture (CCA) Canada, VKhUTEMAS Collection and Museum of the Moscow Institute of Architecture (MARKhI) Moscow, VKhUTEMAS Collection

Figure. 4.34–4.36. A selection of models for the model type 'Deep Space' (Gelatin Silver Prints). Source: Private Collector, London, VKhUTEMAS Collection, Canadian Center for Architecture (CCA) Canada, VKhUTEMAS Collection and Museum of the Moscow Institute of Architecture (MARKhI) Moscow, VKhUTEMAS Collection

Figures. 4.37–4.39. Selection of models depicting the model type Transformation (Gelatin Silver Prints). Source: Canadian Center for Architecture (CCA) Canada, VKhUTEMAS Collection

Figure. 4.40. Balikhin examining an unknown student's work (1923-1926) (Gelatin Silver Prints). Source: Archive of A. V. Shchusev State Museum of Architecture (MUAR), Moscow VKhUTEMAS Collection

Figures. 4.41–4.42. Exhibition of Students work depicting a plethora of model types (1923–1926) (Gelatin Silver Prints). Sources: currently housed at the Moscow School of Architecture

Appendices

Appendix I – Methodology

A pedagogical methodology has been established ensuring the research aims and questions are answered and for the purpose of this thesis, the adopted methodology provides a focussed account for exposing the core pedagogical functions of Discipline Space teaching through the three areas of teaching. This pedagogical inquiry has chosen to adopt a mixed methodological approach, choosing both qualitive and quantitive methods allowing the sourced archival material to become piecing together and analysed to portray new understandings of Discipline Space teaching. The established methodology provides a robust and multi-analysis approach to the pedagogical understanding of how Discipline Space is taught and whether or not the prior theory and teaching of Ladovskii continued to be taught within it.

This methodology covers 5 areas: (1) process analysis, (2) sequence analysis, (3) model-format analysis, (4) pedagogical comparisons: stages of teaching, and (5) comparison of pedagogical findings (1921–1923/1923–1926) in chapter 4. The first four areas provide a full account of how Discipline Space is taught. The findings will be then compared with Ladovskii's three areas of teaching to expose pedagogical differences or similarities between each area of teaching (chapter 5). In the following section a more detailed account of each of the five key areas will be discussed to expose how the research findings will be established.

Process Analysis (chapter 4)

In dealing with a pedagogical study with many areas of pedagogy overlapping and impacting each other through an archival perspective, it is of vital importance for a 'process' to be constructed to portray the way Space teaching is taught. This section outlines eight areas which will allow the 'process' of Space teaching to be portrayed: (1) terms and concepts (appendix III), (2) archival material (vol. II), (3) relationship between 'terms' and 'concepts' and archival material, (4) selection of terms/concepts and photograph descriptions (5), established categories and stages, (6) constructed (process) diagram (pull-out I and II), (7) case studies selection, and (8) analysis of case studies (coding).

(1) Terms and Concepts (appendix II)

The first is the inclusion of the plethora of 'terms' and 'concepts' (appendix III) established through the literature review and are central towards beginning to portray Space teaching. It is not necessary from the beginning to piece together the 'terms' and 'concepts' as a single approach to portray the 'process' of teaching, but to establish the setting of availability to be used in a comparison to the sourced archival material.

(2) Archival Photographs (vol. II, appendix III, VI and V)

The second section will include the sourced archival material (vol. II) taking place through two areas: (1) description analysis and (2) visual analysis. Firstly, the photographs descriptions will remain the first form of detail to be extracted. The second will be a visual analysis providing an alternative understanding of what the sourced photographs portray.

(3) Relationship between 'terms' and 'concepts' and archival photographs

The third section, the photograph descriptions and visual analysis will be used and compared to the 'terms' and 'concepts' to establish the relationships between each confirming connections (if any). The comparison will be strengthened through the visual analysis, arguing

if the pedagogical function as stated through the 'terms' and 'concepts' can be seen within the archival photographs. This stage is important in bringing secondary understanding and primary description and analysis together and will corroborate if what Khan-Magomedov has outlined through his literature is correct. The intention of comparisons is to expose connections between both archival material and 'terms' and 'concepts' establishing a 'pocket' of connections to be taken forward.

(4) Selection of Terms/Concepts and Photograph Descriptions

The fourth section, it is the author's choice to determine which 'term' and 'concepts' and descriptions established are to be taken forward to portray best how Space teaching is taught as a 'process'. To have included all 'terms' and 'concepts' along with photograph descriptions established will go beyond the scope of the research. A selection between 15/20 will be sufficient to allow the process to be portrayed. The inclusion of archival photographs based on the intended connections will provide for a manageable size of case studies to be chosen (see chapter 4). It will remain the author's choice to include such additional 'terms' and 'concepts' if no connections can be established through archival connections. This will provide secondary contextual understandings positioned around the archival material to further portray how Discipline Space is taught.

(5) Established Categories and Stages

The fifth section will establish the order of selected 'terms' and 'concepts' and photograph descriptions. As shown in (chapter 2), Ladovskii's 'process' contained both 'categories' and 'stages' which the author intends to follow as a guide. It is the author's intention to expose more important 'terms' and 'concepts' which reveal more pedagogical importance than others which will justify the choice and position of category, providing further pedagogical clarity to the 'process'.

(6) Constructed (Process) Diagrams (pull out I and II)

The sixth section will portray the 'process' of Space teaching through two diagrams (pull-outs)

to portray the categories and stages chosen. The first diagram will illustrate the 'process' of

teaching and will be positioned at the end of chapter 4 to benefit the author and the reader.

The second diagram (in the form of a table) will contain all primary and secondary material

used in the construction of the first diagram (pull-out II) positioned behind the first pull-out

framing the selection of material which contributed to establishing the 'process' of Space

teaching.

(7) Case Studies Selection

The seventh section will use the constructed diagram as a framework for case selection. The

intended connections between archival material descriptions in relation to the 'terms' and

'concepts' as outlined above will expose a selection of case studies to be taken forwards for

analysis.

(8) Analysis of Case Studies (Coding)

The final section will consist of analysis of case studies and will take place through the chosen

case studies to further the pedagogical understanding of how Discipline Space was taught. The

inclusion of the codes (appendix II) will expose the pedagogical functions during the individual

stages chosen based on the case studies to provide 'new' evidence of Discipline Space

teaching.

Sequence Analysis (chapter 4)

The second area of methodology is 'sequence' and consists of the inclusion of assignment

drawings constructed and issued and will be covered through six areas: (1) assignment

drawings (appendix IV), (2) assignment drawing type, (3) instruction translation, (4) line-

drawings, (5) relationship between type, instruction/line-drawings, and (6) sequence. Each

section provides a thorough understanding of the position and pedagogical function of the role

of the assignment drawing within Discipline Space. The aim of such a robust and focused

approach is to expose the pedagogical functions of each chosen assignment drawing to identify

the role within Discipline Space learning, the 'sequence' of assignments and their role as a

'tool' for teaching Space within chapter 4. The author will establish a table exposing the

findings to be positioned within the core chapter to be referred back to throughout the

sequence analysis.

(1) Assignment Drawings (appendix IV)

The first section will use a selection of assignment drawings as case studies to provide an

objective understanding to portray the assignment drawings. To establish the correct

assignment in relation to the constructed 'process', it is important to choose stages relating

directly to the 'sequence' within the 'process' and at what stage the assignments were taught

and issued.

(2) Assignment Drawing Type

The second section of pedagogical understanding will focus on the assignment drawing type. It

is important to acknowledge from the beginning the different types of assignment drawings

issued to the students as the understanding will set the scene for analysis to take place in the

forthcoming section.

(3) Instruction Translation

The third section the assignment drawings, hand written in the 1920s, have not been

translated and this will be necessary. To translate the assignment drawings is the biggest

challenge which will require time and precision. The author's approach remains careful, setting

aside the necessary time needed for solid translation to be achieved. A high level of accuracy in

the proposed translation will allow the research to provide a coherent approach to the

assignment analysis, revealing what the assignments portrayed and allowing a first-hand

account of the way the instruction was given to the student exposing the pedagogical function

of each assignment drawing selected. Any misinterpretation or wrong translation, in view of

the limited amount of text, will result in incorrect interpretations having a domino effect on

the overall pedagogical understanding of assignment drawing instruction. It is important for

the pedagogical understanding of what instruction became taught, what the pedagogical

instruction was and whether text was provided between each assignment drawing. Translating

the documents will provide a unique approach to portraying new pedagogical understandings

of the assignment drawing function within the overall Space teaching.

(4) Line Drawing(s)

The fourth section will focus on the assignment line-drawings. To understand the format

presented, the line-drawings will be analysed to expose the different function provided to the

student in graphical form. The aim is to demonstrate the role and whether alternative formats

existed, exposing alternative pedagogical functions and identifying what the intention may

have been if differences are exposed.

(5) Relationship between Type/Instruction/Line Drawing(s)

The fifth section is important to expose the relationship between, types, instruction and line-

drawings furthering the pedagogical understanding of the similarities and differences between

each. To establish direct connections will demonstrate deeper pedagogical functions between

each and in turn will expose further pedagogical understandings of the 'sequence' taught.

(6) Sequence Analysis

The final stage of analysis, the assignment drawings will be pieced together utilizing the

pedagogical facts and findings to portray through a 'sequence' how the assignments were

taught. Similarities between each assignment will establish a coherent understanding of the

assignments issued to the students, enabling the pedagogical understanding to be positioned

within the overall 'sequence' of Space teaching and what this meant for the students learning

of Space.

Model-Format Analysis (chapter 4)

After the first two areas of teaching have been established, the third area (model format) will

consist of analysing the models constructed by the students to expose the medium of choice

through constructing Space and the student model types based on the repository findings and

the authors categorization. The approach to the model-format analysis covers three areas: (1)

model-types (Krinskii), (2) model photographs (vol. II, sections 2-8 and appendix V), and (3)

case study selection and analysis (coding).

(1) Model Types (Krinskii)

The first section is an account of the model types established by Krinskii. The prior

understanding within the academic debate of the inclusion of the different model types is

short causing the prior understanding to remain central in establishing further pedagogical

differences based on the repository findings and categorisation.

(2) Model Photographs (vol. II, section 2-8 and appendix V)

The second section, the repository (vol. II, sections 2-8) will be used as the primary focus to

establish the extent of the use of the model and the model types constructed by the student.

The focus on the model photographs has been unexplored allowing for a multitude of

proposed connections to be established. The intention is to extract the photograph

descriptions from both areas of understanding to be used within the comparisons to pull them

across to establish new research findings between each setting. Exposing similarities and

differences based on the model types outlined by Krinskii will provide for robust comparisons

and analysis to establish core research findings of the model types and differences constructed

during Discipline Space. If connections are established, they will be positioned within the

existing type through a specifically constructed table. Should no connections be established leaving a pocket of model types with no prior reference, it is the author's intention to portray such findings as a new type thereby establishing new research findings within the same table.

(3) Case Study Selection and Analysis (Coding)

The third sections will allow the intended case studies to be analysed visually to expose the pedagogical similarities and differences between model types constructed by the student using coding (see appendix II). This approach will expose further research findings of model types stored within the repository through both descriptions and visual analysis to argue for further differences of model types within the repository findings. Further visual analysis will take place between model types exposed through the repository findings to further argue the variational differences which existed. It is the intention to expose differences in scale, material and type to further the pedagogical understanding of differences of types constructed and the similarities and differences between each.

Pedagogical Comparisons: Stages of teaching (chapter 4)

After the three areas of teaching have been portrayed as a form of teaching, an assessment between stages 4 and 8 will take place to analyse and expose any connections or disconnections arguing whether or not the teaching worked as intended. The author argues based on the collected archival material, relationships between further stages based on the constructed 'process' would be too difficult to justify. Based on the sourcing of 'system of visual materials', for example, it is too subjective to be precise in exposing connections between stages 4 and 5 or stages 5 and 8. Further pedagogical understanding through a wider range of research would be needed to be established for the connections to be made, reaching beyond the scope of the research. The following section between stages 4 and 8 is outlined

through four areas: (1), case study selection, (2) assignment drawings, (3) model types, and (4)

pedagogical comparisons.

(1) Case Study Selection

The first area of the intended case studies to be chosen from the assignment drawings and

model types will be central for the comparison to taken place. It is intended, the case studies

selected through the three areas of teaching will be used as the chosen studies for comparison.

(2) Assignment Drawings

The second area of selected case studies is the assignment drawing and will be compared

through three areas: (1) assignment drawing type, (2) instruction, and (3) line drawings to

provide sufficient evidence, using the intended research findings.

(3) Model Types

The third area chooses to use the established 'model-format' research findings. This will be

addressed through two areas of comparison: (1) model type description, and (2) visual analysis.

The use of descriptions will best corroborate if connections between both mediums can be

established, providing direct connections between each. Visual analysis will further

corroborate if any connections between the two mediums can be established beyond the

descriptions.

(4) Pedagogical Comparison

Through the fourth area of comparison, the intention is to expose the relationship of

assignment drawings and whether or not they acted as an instruction within the models

constructed. Each will be compared to one another to establish links, justifying if the teaching

as intended actually worked. It is an option by the author to broaden the scope by including all

assignment drawings and model types stored within the repository should the findings through

the chosen case studies provide little evidence. The aim is to further justify if connections can

be established providing evidence of how Discipline Space is taught.

Comparison of Pedagogical Findings (1921–1923/1923–1926) (chapter 5)

Through the review of Ladovskii's theory and pedagogy (chapter 2), the depth of pedagogical

understanding of Ladovskii's teaching offers the opportunity to establish connections between

both settings of teaching (1921–1923/1923–1926) to expose pedagogical similarities and

differences between each areas. The justification for this comparison is to ask if Ladovskii's

areas of teaching affected the pedagogical functions of each area of teaching within Discipline

Space teaching. It is intended to expose 'pockets' of pedagogical similarities and differences to

establish the core elements of how Discipline Space is taught. This approach will be achieved

through three areas: (1) process comparison, (2) sequence comparison, and (3) model-format

comparison.

(1) Ladovskii's Process (1921–1923) in the context of Discipline Space Process (1923–1926)

The first area of Ladovskii teaching, 'process' (section 1.6.1), is important to expose

pedagogical similarities and differences between each through categories and stages. It is the

intention to use the prior understandings of Ladovskii's 'process' of teaching (Table 1.1) as

comparisons to the intended research findings of the 'process' of Discipline Space teaching

(Chapter 5). What is intended to be exposed is 'pockets' of pedagogical similarities and

differences between each 'process' to argue if the 'process' of Ladovskii was taught within

Discipline Space teaching and whether it became taught differently.

(2) Ladovskii's Sequence (1921–1923) in the context of Discipline Space Sequence (1923–1926)

Through the second, the prior understanding of 'sequence' of assignment drawings as outlined

in (section 1.6.2) will be used to compare to the intended research findings (chapter 5). We

have already seen acknowledged the 6 instructions outlined by Ladovskii through his

assignment drawings taught during OBMAS. It is intended to use a similar approach to establish

what instruction is present within the chosen assignment drawing case studies. This will expose the pedagogical similarities and differences between each and in turn will expose if the prior instruction and format remained taught and the pedagogical differences (if any) between each.

(3) Ladovskii's Model-Format (1921–1923) in the context of Discipline Space Model-Format (1923–1926)

Through the third area of comparison, the continuation of prior understanding of Ladovskii's teaching of 'model-format' is central in exposing the primary medium chosen to construct Space (section 1.6.3). This will take place solely through 'abstract' tasks taught showing the comparisons between each from the repository findings as no evidence at this stage reveals 'production' tasks were constructed during Discipline Space. The intention is to expose the use of the medium used, and the differences (if any) of the types constructed by the students and which medium became the primary medium to teach and construct Space and whether or not such choice impacted the students learning of Space. The intention is for 'pockets' of core findings based on the comparisons through similarities and differences based on each area of teaching to be carried forward into the overall conclusion of research which the author will argue, defined how Discipline Space is taught which were previously unknown to the academic debate.

Appendix II

Discipline Space Assessment Methods

A Discipline Space assessment will take place by examining the archival material to corroborate findings across data sets thus reducing the impact of potential biases that can exist in a single study. A selection of seven methods of assessment will be used conjointly within the multi-analysis approach: (1) process of teaching as a [framework] for case studies selection, (2) criteria for case selection and case studies selection, (3) document analysis method (4) photograph analysis method, (5) Discipline Space coding, (6), photograph category types: workshop (lecture hall), models, system of visual materials and exhibition photographs, and (7) comparative analysis method. The choice of assessment has been dictated by the nature of this pedagogical inquiry.

Process of Teaching as a [Framework] for Case Studies Selection

Through the intended established 'process' of teaching the following section outlines how the case studies are to be chosen within the process. The justification for stage selection was dependent on two factors; firstly, the importance of the stage pedagogically within the 'process'; secondly, the availability of archival material pertaining to including stages chosen to depict the 'process' of teaching. The collection of sourced material is important, providing sufficient evidence to be used to fill the pedagogical gaps in scholarship. The case selection requires detailed investigation of the pedagogical stages in given categories of the teaching of Space. The locational choice also benefits the assessment since stages would vary because of different pedagogical functions occurring. However, there are two reasons for stages within the 'process' not being selected for analysis. Firstly, applicability within the 'process' has seemed secondary in nature, providing no new understanding to assist with the aims of the

research. Secondly, it has not been possible to source within the repository any relevant material which can establish a pedagogical account of how Space is taught.

This section now addresses the available archival material in the context of the repository in relation to the stages within the constructed 'process' (table A.2). In stage three, only one photograph was sourced in the archive (vol. II, section 10). In stage 4, a selection of (14) assignments were sourced, (5) from the archive (MARKhI) and (9) from secondary sources (vol. II, section 1). In stage 5, (7) system of visual materials remain sourced (vol. II, section 9). In stage 6, only one photograph was sourced between the archives, institutions and private collections; however, in stage 8 there were 949 case studies (vol. II, section 2–8). In stages (9), (10), (11) and (12) only 1 photograph is sourced (vol. II, section 10). As the author will later argue, four stages appear within the single photograph. Finally, in stage 16 there are (10) photographs (vol. II, section 10). These cases will be chosen, as carefully as possible, according to their potential to construct a complete description of how the pedagogical requirements were spatially configured for each stage of teaching. The cases with different pedagogical characteristics will be chosen from different stages of pedagogy and reflect the development process of Space in a given pedagogical stage. This was not always the case, as the sourced archival material did not at times allow stages relating to the 'process' of teaching as they do not exist, (1), (2), (7), (13), (14), (15), and (17).

Discipline Space Process of Teaching (1923–1926)	Repository of Archival Material in the context of Stages of Teaching
Category 1: Assignments	
Stage 1. Introductory Lecture and Program Content	
Stage 2. Organising Equipment	
Stage 3. Discussion of Assignments	**(1)**
Stage 4. Assignments Approved	**(14)**
Category 2: Working Process	
Stage 5. System of Visual Materials	**(9)**
Stage 6. Workshop (Lecture Hall)	**(1)**
Stage 7. Collective Discussions (i)	
Stage 8. Construct through Modelling	**(949)**
Category 3: Dialectic Process	
Stage 9. Collective Discussions (ii)	**(1)**
Stage 10. Collective Evaluation	**Same as above**
Stage 11. Assimilate the Discipline	**Same as above**
Stage 12. Development of Critical skills	**Same as above**
Category 4: Evaluation and Conclusion	
Stage 13. The Correction of Shortcomings	
Stage 14. Examined by Commissions and Assessment	
Stage 15. Improve Mark	
Stage 16. Exhibition of Student Works	**(10)**
Stage 17. Concluding Interview	

Table. A.2.1. Categories and stages for the Process of Discipline Space (1923-1926) and archival relationships to material in relation to stages of teaching, see (vol. II) for full account of material. Table constructed by author

Criteria for Case Selection

When working with a large body of primary material split between numerous stages, it is important for the integrity of the research that a case study strategy is used to achieve the aims of the research. It is apparent that not all sourced material can be included within the research based on the number of materials sourced, as there would be too many for the research aims to be achieved, especially stages (4), (5), (8), and (16). Stages contain only one photograph (3), (6), (9), (10), (11), and (12) will not require a strategy to be implemented. The approach to case study selection will take a multi-case selection strategy approach, based on the stages of teaching where multiple archival material is positioned. The following section covers three areas: (1), sample size, (2) multi-case strategy selection, and (3) maximum variations.

(1) Sampling Size

Through the wide collection of archival material, it is important to introduce a sampling size to manage the amount of case studies selected. Sample sizes vary depending on the purpose of the study and can be affected by various factors based on research topics.[167] To approach the chosen amount of case studies to be selected, a case study design must have five components: the research question(s), its propositions, its unit(s) of analysis, a determination of how the data are linked to the propositions and criteria to interpret the findings.[168] Emphasized that the number and type of case studies depends upon the purpose of the inquiry: an instrumental case study is used to provide insight into an issue; an intrinsic case study is undertaken to gain a deeper understanding of the case; and the collective case study is the study of a number of cases in order to inquire into a particular phenomenon.[169] Case studies are the preferred strategy when 'how' and 'why' questions are posed.[170] These types are factual, interpretative and evaluative. Each case study must outline the purpose, then depending on the type of case study and the actions proposed by the researcher, the researcher could determine the possible products of the study.[171] Through the position of the sourced material in relation to stages of teaching, no more than 40 case studies will be selected providing sufficient sampling size in comparison to the repository findings.

(2) Multi-Case Selection Strategy

The second area through case study selection consists of choosing case studies with more than one example available where a multi-case selection strategy will be implemented. The justification for a multi-case strategy is important for reducing the amount of material through

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[167] Green, J. and Thorogood, N. (2004), *Qualitative methods for health research*, London: Sage Publications. See Strauss, A. and Corbin, J. (1990), *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, California: Sage Publications

[168] Yin, R. K. (1994), *Case Study Research: Design and Methods*, Thousand Oaks, California: Sage Publications

[169] Stake, R. E. (1995), *The art of case study research*. Thousand Oaks, California: Sage Publications

[170] Yin, *Case Study Research: Design and Methods*

[171] Guba, E. G. and Lincoln, Y. S. (1981), *Effective Evaluation*, San Francisco, California: Jossey-Bass Publishers

the stages which include multiple cases. Multiple-case designs have distinct advantages and disadvantages in comparison with single-case designs. The evidence from multiple cases is often considered more compelling, and the overall study is therefore regarded as being more robust.[172] The decision to undertake multiple-case studies cannot be taken lightly. Every case should serve a specific purpose within the overall scope of inquiry. Focusing solely on one type of case study will only provide short accounts, it is necessary to select a number of case studies for stage selection within the set boundary. Based on the large setting of sourced material and the multiple cases for each stage, an approach of maximum variations has been chosen to reduce the amount for case selection to a manageable size.

(3) Maximum Variation Sampling

The third area of case study selection, the author has chosen 'maximum variations' as the most suitable and objective approach to reducing the amount of case studies through the stages outlined above for selection (table A.2.1). Even when a criteria for case studies selection is to be developed at the outset of the study, interdependency between the cases can exist in such a way that choosing the first case can affect the choice of the second and so on. How does one maximise variation in a sample? One begins by identifying diverse characteristics or criteria for constructing the sample. When selecting a sample of great diversity, the data collection and analysis will yield two kinds of findings: (1) high-quality, detailed descriptions of each case, which are useful for documenting uniqueness and (2) important shared patterns that cut across cases and derive their significance from having emerged out of heterogeneity.[173]

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[172] Herriott, R. E. and Firestone, W. A. (1983), 'Multisite Qualitative Policy Research: Optimising Description and Generalisability' *Educational Researcher*, 12 (2), pp. 14-19
[173] Patton, M. Q. (1990), *Qualitative Evaluation and Research Methods*, Newbury Park, California: Sage Publications, p. 172

Types of Purposeful Sampling Strategies	Definition of the Sampling Strategy
Extreme case	These cases demonstrate usual manifestations of the phenomenon, such as outstanding success and notable failures
Intensity case	This case is information rich but not an extreme case
Maximum variation	**Case, despite having diverse variations, exhibits important common patterns that cut across variations**
Homogeneous	Variation between cases is minimised, analysis is simplified and study is focussed
Typical case	Case illustrates what is typical, normal or average
Stratified purposeful case	Case illustrates characteristics of a particular subgroup to facilitate comparison and not for generalisation or representation
Critical case	Case that permits logical generalisation to other cases because if it is true to this one case, it is likely to be true to all other cases
Snowball	Cases of interest from people who know people who know and know cases, rich information is rich, good examples for study, etc.
Criterion	Cases picked because they meet some predetermined criterion
Theoretical	The cases are manifestation of a theoretical construct and are used to examine and elaborate on
Confirming and disconfirming	Cases that elaborate on initial analysis to see exceptions or test variations
Opportunistic	Cases that emerge from the following leads during field work
Random purposeful	Cases are randomly selected from a large sample for the purpose of increasing credibility and not for generalisation or representation
Politically important case	Cases are selected or eliminated because they are politically sensitive cases
Convenience	Cases are selected on the basis of minimum effort, time and money. They are candidate examples of low credibility, information rich cases.
Combination	Cases are flexible and meet different interests and needs

Table. A.2.2. Purposeful sampling strategies and their operational definitions, source: (Patton, 1990, pp. 182-183)

Stage 4 (Assignment Approved and Issued)

A selection of 7 case studies out of 14 assignment drawings for stage 4 will be chosen, each depicting different types to allow for an objective approach to understanding the pedagogical function within Space teaching. The intention is to use both sourced unpublished material as the first choice, followed by a selection of secondary assignment drawings that portray maximum variations between each providing robust approach to portray the pedagogical function of the assignment drawing.

Stage 5 (System of Visual Materials)

A selection of five case studies out of the nine sourced will be chosen for stage 5 to portray different periods of architecture and art, allowing for a broad analysis of each to take place. It is important to choose case studies that relate to the period of research (1923–1926). Through

description modification (section 3.4.3), a board depicting contemporary architecture was portrayed through the CCA as 1920–1926, when in actual fact the material on the board was from 1928 onwards allowing the true account to be established, which caused the board to be omitted from the repository and selection reducing the focus on archival material.

Stage 8 (Construct through Modelling)

The selection of models constructed based on the repository categorisation (949 case studies); twenty two case studies will be chosen for stage 8 within the seven model types which have been exposed through repository categorization. A selection of three or four examples based on maximum variations within each type will be selected to provide a selection of objective variational differences.

Stage 16 (Exhibition of Student Work)

Ten exhibitions photographs were sourced depicting evidence of multiple exhibitions from a range of different workshop environments for stage 16; however, only 2 will be chosen relating directly to Space teaching, each providing model type differences within. These chosen photographs will form the final stages of analysis and are important for capturing the pedagogical function of Space teaching.

Through the 10 stages of teaching outlined where connections can be established to the sourced archival material, it is the intention of 39 case studies of assignment drawings, models, system of visual materials, workshop and exhibition photographs in total to be selected to be examined.

Soviet Translation and Document Analysis Method

Through the inclusion of assignment drawings to be used through the second area of teaching, a form of analysis will be necessary to unlock the pedagogical functions contained within. Before the assignments can be analysed it is important for the assignments to firstly become

translated. Using the acquired translation skills developed for the purpose of the research will be central to portraying the 'sequence' within the process of teaching. Like other analytical methods in qualitative research, document analysis requires that data be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge.[174] Atkinson and Coffey refer to documents as 'social facts,' which are produced, shared, and used in socially organised ways.[175] Document analysis is often used in combination with other qualitative research methods as a means of triangulation—'the combination of methodologies in the study of the same phenomenon'.[176] By triangulating data, the researcher attempts to provide 'a confluence of evidence that breeds credibility'.[177] Furthermore, as Merriam points out, 'Documents of all types can help the researcher uncover meaning, develop understanding, and discover insights relevant to the research problem.'[178] Bearing witness to past events, documents provide background information as well as historical insight by tracking changes and development, and verifying findings or corroborating evidence from other sources. Assignment analysis will allow the assignments to be deciphered; unlocking the different pedagogical functions contained within and is a process of evaluating the documents in such a way that empirical knowledge is produced and understanding is developed. It is important to consider the original purpose of the assignment drawing and why it was produced. The research will determine whether the assignment drawings are even (balanced) or uneven (containing much detail on some aspects of the subject and little or nothing on other aspects).

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[174] Corbin, J. and Strauss, A. (2008), *Basics of qualitative research: Techniques and procedures for developing grounded* theory (3rd ed.), Thousand Oaks, California: Sage Publications. See Rapley, T. (2007), *Doing conversation, discourse and document analysis*. London: Sage

[175] Atkinson, P. A. and Coffey, A. (1997), 'Analysing documentary realities', p. 47 in Silverman, D. (Ed.), *Qualitative research: Theory, method and practice*, London: Sage Publications

[176] Denzin, N. K. (1970), *The research act: A theoretical introduction to sociological methods*, New York: Aldine, p. 291

[177] Eisner, E. W. (1991), *The enlightened eye: Qualitative inquiry and the enhancement of educational practice*, Toronto, Canada: Collier Macmillan, p. 110

[178] Merriam, S. B. (1988), *Case study research in education: A qualitative approach*, San Francisco: Jossey-Bass, p. 118

Photograph Analysis Method

The selection of sourced archival photographs in comparison to the stages of teaching will be analysed through a form of photographic analysis to expose pedagogical findings during Space teaching and each requires a method of photograph analysis. Stated by Hortin, 'The ability to understand (read) and use (write) images and to think and learn in terms of images' is often called visual literacy.[179] The main source of photographs for observation and analysis is, however, found in the work of the two visual anthropologists, Collier and Collier.[180] Collier and Collier show how photography can be used, not only for illustrations as is often seen within anthropology and other research fields, but as a 'research method,' in which photographs replace field notes as data for analysis. The phrase 'a picture is worth a thousand words' is visualised in Collier and Collier's photographs.[181] They reflect questions in the way that they stay open to interpretation. In this way Collier and Collier show how photography can be useful in a preliminary study, presenting an overview and opening the way for further and more detailed investigations. For use of photography in qualitative research, either as data or as data generators, an idea of how viewers treat and understand photographic images is necessary, such as whether those viewers are informants or researchers. Martin Lawn, Ian Grosvenor and Rousmaniere have been interested in developing an agreed critical practice among historians for using photographs as historical evidence.[182] They cite Roland Barthes in connection with audience and meaning, 'The reading of a photograph is … always historical; it depends on the

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[179] Bradent, R, A. and Hortin, J. A. (1982), 'Identifying The Theoretical Foundations of Visual Literacy', *Journal of Visual Verbal Languaging*, 2 (2), p. 25

[180] Collier, J. and Collier, M. (1986), *Visual Anthropology—Photography as a Research Method*, Albuquerque: University of New Mexico Press

[181] Collier, J. (1974), *Photography and Visual Anthropology* in Hockings, P. (Ed), *Principles of Visual Anthropology*, Berlin: Mouton de Gruyter, pp. 235-254

[182] Hardcastle, J. (2013), 'Photographers are the devil: an essay in the historiography of photographing schools', *History of Education Society*, 42 (5), p. 662

reader's knowledge … intelligible only if one has learned the signs.'[183] Through the plethora of archival material to be analysed depicting the teaching of Space in photographic form resulted in the inclusion of photographic analysis method.

Space Photographs (Coding)

The research approach to the period of Space teaching has lacked any pedagogical analysis and is important for the research to focus solely on the pedagogical narrative moving away from its historical perspective to expose the intended research findings. To extract the level of detail required to portray how Space teaching is taught pedagogically, a multi-analysis approach is involved in the photographic representation. To analyse the pedagogical functions of Space teaching through photographic analysis, it is important to provide alternative forms of photograph analysis based on the different types of chosen photograph. As Slater notes, much of the rigor of classic content analysis relies on a structure of categories used in the coding process, because the categories should be apparently objective in a number of ways and therefore only describe what is 'really' there in the text or image.[184] More recent users of content analysis have developed their categories in relation to their theoretical concerns so that their categories are immediately more obviously interpreted.[185] The coding to be included within Discipline Space analysis must include a number of characteristics, regardless of their putative status as descriptive or interpretive. Specific photographs will portray different meanings, depending upon the content of the image, justifying the requirement for different forms of coding to be established to target specific pedagogical functions within each of the chosen photographs.

[183] Ibid
[184] Slater, D. (1998), *Analysing cultural objects: Content analysis and semiotics*, p. 236 in Seale, C. (Ed.), *Researching Society and Culture*, London: Sage
[185] Lutz, C. A. and Collins, J, L. (1993), *Reading National Geographic*, Chicago: University of Chicago Press, p. 59 as quotes in Rose, G. *Visual Methodologies: An Introduction to the Interpretation of Visual Material*, Thousand Oaks, California: Sage Publications

Photograph Category Types: Workshop (Lecture Hall), Models, System of Visual Materials and Exhibition Photographs

The categorisation of archival material established through the repository construction, different photograph types based on translation has become established. It was necessary to construct specific codes based on the types established. The coding (table A.3) will allow for a multi-photographic analysis to take place through stages (3), (4), (5), (6), (9), (10), (11), (12), and (16). The four coding categories (A, B, C and D) are based on the type of photographs chosen, split between workshop (lecture hall), models, system of visual materials and exhibition photographs. Type A has been categorised as a workshop (lecture hall); Type B as models; Type C represents system of visual materials; and Type D, exhibition of student works.

Code (Type A) Workshop (Lecture Hall) (stages 3, 6, 9–12)

Type A has been established relating to stages (Stage 3–Discussion of Assignments), (Stage 6–Workshop (Lecture Hall), and (Stages 9-12–Collective Discussions (ii), Collective Evaluation, Assimilate the Discipline and Development of Critical Skills) and contained within workshop (lecture hall) photographs is a multitude of pedagogical activity. Ten codes have been established targeting specific pedagogical functions to expose the pedagogical activity contained through capturing how Space is taught (table A.2.2).

Code (Type B) Models (stage 8)

Type B has been developed with a focus on model types (Stage 8–Construct through Modelling). As less detail is contained within the photographs with little context beyond the models is included within the photographs, seven codes have been established accordingly (table A.3). The model solutions vary through the wide availability of material and, depending upon the model type, at times there may be multiple models contained within individual

photographs. The coding has been developed to allow analysis of either a single model or multiple models.

Code (Type C) System of Visual Materials (Stage 5)

Type C has become established with a focus on a selection of system of visual materials (Stage 5). The choice of six codes are central to photograph analysis, as there appear to be multiple types of architectural and art precedents included within the photographs. If the photograph depicts a form of precedent which is different or unique, then further interpretation beyond the codes will be considered to further the pedagogical understanding of the way Space is taught (table A.2.2).

Code (Type D) Exhibition of Student Works (stage 16)

Eight codes have been established for type D. The location of the exhibition photographs are important for establishing the environment in which the teaching was exhibited. The codes are important for portraying how the exhibition contributed to Discipline Space teaching and the overall learning of Space (table A.2.2).

Coding: Photographs– (Type A) Workshop (Lecture Hall)	Coding: Photographs– (Type B) Model Type	Coding: Photographs– (Type C) System of Visual Materials	Coding: Photographs–(Type D) Exhibition of Student Works
1. Location	**1.** Model Characteristics	**1.** Period of History	**1.** Location
2. Group size	**2.** Materiality	**2.** Pedagogical Function of Board	**2.** Model Type
3. Surroundings of people photographed	**3.** Pedagogical Function	**3.** Relationship with other boards	**3.** Number of Model(s) (if present)
4. Camera gaze of main person photographed	**4.** Relationship with other models through type, material and scale	**4.** Relationship with Discipline Space	**4.** Materiality of Model(s)
5. Model Type(s)	**5.** Relationship with Discipline Space	**5.** Pedagogical Purpose	**5.** Pedagogical Activity
6. Number of Model(s)	**6.** Pedagogical Purpose	**6.** Impact on Students Learning	**6.** Pedagogical Function
7. Materiality of Model(s)			**7.** Relationship with Discipline Space Teaching
8. Pedagogical Activity			**8.** Impact on Students Learning
9. Relationship with Discipline Space Teaching			
10. Impact on Discipline Space Learning			

Table. A.2.3. Coding four types (A) Workshop (Lecture Hall), (B) Model Type, (C) System of Visual Materials and (D) Exhibition of Student Works. Table constructed by author

Comparative Analysis Method

One of the more important methods based on the pedagogical focus of the research through the archival perspective is comparative analysis. Historical comparisons can serve a plethora of purposes through the pedagogical approach to portray how Discipline Space became taught. According to one prominent contributor, Jürgen Kocka, heuristically, the comparative approach allows one to identify questions and problems that one might miss, neglect, or not invent otherwise. Analytically, the comparative approach is indispensable for asking and answering causal questions about important social processes and their outcomes. Pragmatically, comparisons help to distance oneself from the case one knows best. Because of this, comparisons can have a de-provincialising, an eye-opening impact on the analysis.[186] According to Patton, triangulation helps the researcher guard against the accusation that a study's findings are simply an artifact of a single method, a single source, or a single investigator's

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[186] Kocka, J. (2003), 'Comparison and Beyond', *History and Theory*, 42 (1), pp. 39-44

bias.[187] The inclusion of comparison analysis will allow the construction of the 'process' of teaching to be pieced together to allow for a comprehensive understanding of how Space is taught. It will also establish the assignment drawings through the different forms of type, instruction, line-drawings and sequence to be compared to one another to provide a solid understanding of the pedagogical function of the sequence of Space teaching. The notion of triangulation will allow for assignment drawings and photographs to be 'stitched' together to provide alternative understandings of how Discipline Space is taught through comparison of stages. The three areas of pedagogy will be compared to expose the pedagogical differences between each period of teaching allowing the comparative approach to play a central role through exposing pedagogical similarities and differences. In order to critique past interpretations and produce new findings, this choice of method is crucial to exposing the way Discipline Space is taught.

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[187] Patton, M. Q. (1990), *Qualitative Evaluation and Research Methods*, Newbury Park, California: Sage Publications

Appendix III–Terms and Concepts

Terms and Concepts of Discipline Space Teaching	Literature of Khan-Magomedov
1. Assignment's tasks are approved	Khan-Magomedov, 2007, p. 263
2. Workshop (lecture hall)	Khan-Magomedov, 2007, p. 263
3. Several Interviews	Khan-Magomedov, 2007, p. 263
4. Assignments Issued	Khan-Magomedov, 2007, p. 263
5. Examples from Historical and Modern Architectures	Khan-Magomedov, 2007, p. 263 and Khan-Magomedov, 1990 (French), pp. 529-530
6. System of Visual Materials	Khan-Magomedov, 2007, p. 263
7. Collective Assessment	Khan-Magomedov, 2007, p. 264
8. Special Protocol	Khan-Magomedov, 2007, p. 264
9. Collective discussions	Khan-Magomedov, 1990 (French), pp. 529-530 and Khan-Magomedov, 2007, p. 263
10. Collective Evaluation	Khan-Magomedov, 2007, p. 263
11. Correct all Shortcomings	Khan-Magomedov, 2007, p. 263
12. Improve their Mark	Khan-Magomedov, 2007, p. 264
13. Best works are photographed and selected for annual exhibitions	Khan-Magomedov, 2007, p. 264
14. Introductory Lecture	Khan-Magomedov, 1990, Volume 2. p. 542 and Khan-Magomedov, 2007, p. 264
15. Organizing Equipment	Khan-Magomedov, 1990, p. 526
16. Working Process	Khan-Magomedov, 2007, p. 264
17. Dialectic Process	Khan-Magomedov, 2007, p. 264
18. Program Content	Khan-Magomedov, 2007, p. 263
19. Evaluation and Conclusion	Khan-Magomedov, 2007, p. 264
20. Assignment's tasks are approved beforehand	Khan-Magomedov, 2007, p. 263
21. Several interviews with students where they talk about this discipline	Khan-Magomedov, 2007, p. 263
22. Collective discussions also take place after completion of each task	Khan-Magomedov, 2007, pp. 263-264
23. Criticism of Comrades	Khan-Magomedov, 2007, p. 264
24. Receiving feedback from groupmates	Khan-Magomedov, 2007, p. 263
25. Assimilate the Discipline	Khan-Magomedov, 2007, p. 264
26. Correct all Shortcomings	Khan-Magomedov, 2007, p. 263
27. Marks is Given	Khan-Magomedov, 2007, p. 264
28. Improve their Mark	Khan-Magomedov, 2007, p. 264
29. Interview about the past task takes place	Khan-Magomedov, 2007, p. 264
30. The task for the next Discipline is given	Khan-Magomedov, 2007, p. 264
31. Examined by the commission and Assessment	Khan-Magomedov, 2007, p. 263
32. Concluding Interview	Khan-Magomedov, 2007, p. 264
33. Development of Critical Skills	Khan-Magomedov, 2007, p. 264
34. Assignments	Khan-Magomedov, 2007, p. 263
35. Students were taught in the main compartment to construct through models	Khan-Magomedov, 1996
36. Concluding Interview	Khan-Magomedov, 2007, p. 264

Appendix IV–Assignment Drawing Descriptions (vol. II, Section 1)

Assignment Drawings	Source Literature and Archives
1. Ivan Lamtsov: Form January 18th, 1924	Khan-Magomedov, 2007, pp. 266-272
2. Ivan Lamtsov: Surface, November 24th, 1924	Moscow School of Architecture (MARKhI) and Khan-Magomedov, 2007, pp. 266-272
3. Mikhail Turkus: Relationship, Proportions, Meter, Rhythm, and Dynamics, December 10th, 1924	Khan-Magomedov, 2007, pp. 266-272
4. Ivan Lamtsov: Space, 1924/1925	Khan-Magomedov, (1990), Russian edition pp. 249-251, Khan-Magomedov, (1990), French edition p. 520, Khan-Magomedov, (1995), pp. 66-81 and Khan-Magomedov, (2007), pp. 266-272
5. Mikhail Turkus: Form, 1925	Khan-Magomedov, (1990), Russian edition pp. 249-251, Khan-Magomedov, (1990), French edition p. 520, Khan-Magomedov, (1995), pp. 66-81 and Khan-Magomedov, (2007), pp. 266-272
6. Ivan Lamtsov: Form, January 12th, 1925	Moscow School of Architecture Museum (VKhUTEMAS Collection, MARKhI, Moscow)
7. Mikhail Turkus: Form, January 2nd, 1925	Khan-Magomedov, (1990), Russian edition pp. 249-251, Khan-Magomedov, (1990), French edition p. 520, Khan-Magomedov, (1995), pp. 66-81 and Khan-Magomedov, (2007), pp. 266-272
8. Ivan Lamtsov: Mass and Weight, March 2nd, 1925	Moscow School of Architecture Museum (VKhUTEMAS Collection, MARKhI, Moscow)
9. Ivan Lamtsov: Mass and Weight, March 2nd, 1925	Khan-Magomedov, (1990), Russian edition pp. 249-251, Khan-Magomedov, (1990), French edition p. 520, Khan-Magomedov, (1995), pp. 66-81 and Khan-Magomedov, (2007), pp. 266-272
11. Ivan Lamtsov: Mass and Weight February 8th, 1926	Moscow School of Architecture Museum (VKhUTEMAS Collection, MARKhI, Moscow)
12. Ivan Lamtsov: Mass and Weight February 8th, 1926	Moscow School of Architecture Museum (VKhUTEMAS Collection, MARKhI, Moscow)
10. Mikhail Turkus: Mass and Weight February 10th, 1926	Khan-Magomedov, (1990), Russian edition pp. 249-251, Khan-Magomedov, (1990), French edition p. 520, Khan-Magomedov, (1995), pp. 66-81 and Khan-Magomedov, (2007), pp. 266-272
13. Ivan Lamtsov: Mass and Weight March 8th, 1926	Moscow School of Architecture Museum (VKhUTEMAS Collection, MARKhI, Moscow)
14. Ivan Lamtsov: Space March 29th, 1926	Khan-Magomedov, (1990), Russian edition pp. 249-251, Khan-Magomedov, (1990), French edition p. 520, Khan-Magomedov, (1995), pp. 66-81 and Khan-Magomedov, (2007), pp. 266-272

Appendix V–Model Types Descriptions (vol. II, Sections 2-8)

Discipline Space Model (Types) (1923-1926)
Surface – (Krinskii)
1. Horizontal and Vertical Division of Surface
2. Horizontal and Vertical Division of Surface with Tone
3. Partial Division of Surface (Vertical and Horizontal, Relief and Shade)
4. Frontal Surface Vertically Limited Rhythmical Row
5. Combination of Rhythm and Measure on Frontal Surface
6. Meeting Vertical Rhythmical Rows on Frontal Surface
7. Construction of Frontal Surface Based on Vertical, Horizontal and Inclined Combination of Two or More Rhythmical Rows
8. Design of the Frontal Surface Based on Relief and Counter-relief
9. Complex Composition Showing Combination of Texture, Material and Form of the Frontal Surface
10. Architectonic Design of the Frontal Surface
11. Combination of Rhythm and Measure on Frontal Surface
12. Complex Frontal Composition Based on Contrasting Elements
13. Frontal Composition with Spatial Elements
14. Frontal Surface with a Complex Composition of a Combination of Texture, Material and Shapes
15. Frontal Plane Based on Counter Relief
16. Complex Frontal Composition Based on Contrasting Elements
17. Frontal Plane Based on Counter Relief
Frontal Space – (Author)
1. Organization of Space over a Horizontal Surface (Rectangular, Square, Round)
2. Deep Frontal Composition
3. Complex Frontal Composition Based on Nuance and Contrast Combination of Plastic and Shade and Using Elements of Rhythm
Space and Volume - (Author)
1. Constructing and Finding a Spatial Voluminous Composition Using Surface Elements
2. Voluminous Form (Cylinder) with Inclusion of Additional Elements in Space
3. Organization of Space in a Rectangular Area
Form – (Krinskii)
1. Finding the Expressiveness of Form of the Simplest Geometrical Configuration: Parallelepiped
2. Constructing and Finding a Spatial Voluminous Composition Using Surface Elements
3. Form of Blunt Massive Volume (Parallelepiped, Cylinder, Complex Configuration)
4. Organization of Inner Space
5. Organization of Space in a Rectilinear Areas
6. Finding a Voluminous Form of set configuration (Inverted Cone)
7. Form of Blunt Massive Volume (Parallepiped Cylinder Complex configuration)
Mass and Weight – (Krinskii)
1. Constructing a Voluminous Form with Finding and Expressing Mass and Weight
2. Constructing a Voluminous Composition based on correlation of mass (cube) and support
Deep Space – (Krinskii)
1. Organization of Space Inside of a Spatial Cube
2. Deep Space with Strongly Emphasized Foreground
3. Deep Space Architectonic Composition on Circle
4. Organization of Space on a rectilinear plane
Transformation – (Author)
1. Transformation on a vertical Pane
2. Texture Transformation
3. Transformation of Tension Structure

Appendix VI–System of Visual Materials, Workshop and Exhibition Descriptions (vol. II, Sections 9-10)

System of Visual Materials, Workshop and Exhibition Photographs	Archival Sources
1. Presentation boards of photographs of models, drawings, buildings, sculptures, paintings and magazine clippings used for didactic purposes	Canadian Centre for Architecture (VKhUTEMAS Collection, CCA, Canada)
2. Presentation boards of photographs of models, drawings, buildings, sculptures, paintings and magazine clippings used for didactic purposes	Canadian Centre for Architecture (VKhUTEMAS Collection, CCA, Canada)
3. **Presentation boards of photographs of models, drawings, buildings, sculptures, paintings and magazine clippings used for didactic purposes. Presentation board of Photographs of student works for the task Surface (1923-1926)**	Canadian Centre for Architecture (VKhUTEMAS Collection, CCA, Canada)
4. Presentation boards of photographs of models, drawings, buildings, sculptures, paintings and magazine clippings used for didactic purposes. Presentation board of Photographs depicting a monuments	Canadian Centre for Architecture (VKhUTEMAS Collection, CCA, Canada)
5. **Presentation boards of photographs of models, drawings, buildings, sculptures, paintings and magazine clippings used for didactic purposes. Presentation board of Photographs and drawings of architectural examples (1400s-1500s)**	Canadian Centre for Architecture (VKhUTEMAS Collection, CCA, Canada)
6. **Presentation boards of photographs of models, drawings, buildings, sculptures, paintings and magazine clippings used for didactic purposes. Presentation board of Photographs depicting architectural examples (1200-1500)**	Canadian Centre for Architecture (VKhUTEMAS Collection, CCA, Canada)
7. **Presentation boards of photographs of models, drawings, buildings, sculptures, paintings and magazine clippings used for didactic purposes. Presentation board of Photographs of Artistic precedents contained within cabinet**	Canadian Centre for Architecture (VKhUTEMAS Collection, CCA, Canada)
8. **Presentation boards of photographs of models, drawings, buildings, sculptures, paintings and magazine clippings used for didactic purposes. Presentation board of Photographs depicting a wide selection of architectural and art references**	Moscow School of Architecture Museum (VKhUTEMAS Collection, MARKhI, Moscow)
9. **Exhibition of student works on various types in the lecture hall of the main department (1923-1926)**	Moscow School of Architecture Museum (VKhUTEMAS Collection, MARKhI, Moscow)
10. Basic Course Report exhibition of student projects showing models, drawings and sculptures	Private Collector (I)
11. Basic Course Report exhibition of student projects showing models, drawings and sculptures	Canadian Centre for Architecture (VKhUTEMAS Collection, CCA, Canada)
12. Basic Course Report exhibition of student projects showing models, drawings and sculptures	Private Collector (I)
13. Basic Course Report exhibition of student projects showing models, drawings and sculptures	Canadian Centre for Architecture (VKhUTEMAS Collection, CCA, Canada)
14. Basic Course Report exhibition of student projects showing models, drawings and sculptures	Private Collector (I)
15. Basic Course Report exhibition of student projects showing models, drawings and sculptures	Private Collector (I)
16. Partial Division of Surface (Vertical and Horizontal, Relief and Shade)	Moscow School of Architecture Museum (VKhUTEMAS Collection, MARKhI, Moscow)
17. **Exhibition of student works on the 'Revelation and Expression of Mass and Weight' in the lecture hall of the Basic Department (1923 – 1926)**	Moscow School of Architecture Museum (VKhUTEMAS Collection, MARKhI, Moscow)
18. Partial Division of Surface Vertical and Horizontal, Relief and Shade	Canadian Centre for Architecture (VKhUTEMAS Collection, CCA, Canada)
19. **VKhUTEMAS students during a Space course lesson exercise on the revelation of 'Mass and Weight' (1925)**	Archive of A. V. Shchusev State Museum of Architecture (MUAR, Moscow)
20. Portrait of an unidentified student at the VKhUTEMAS	Canadian Centre for Architecture (VKhUTEMAS Collection, CCA, Canada)
21. **Balikhin examining an unknown student's work (1923-1926)**	Archive of A. V. Shchusev State Museum of Architecture (MUAR, Moscow)
22. **Krinskii with students and Korzhev (left, in checked shirt) with Turkus (wearing tie) discussing assignments**	Archive of A. V. Shchusev State Museum of Architecture (MUAR, Moscow)