

# Manual for integral planning of university campus

## Abstract

This paper aims to analyze the Manual for Integral Planning of University Campus, written by Rudolph Atcon and published by the Council of Rectors of Brazilian Universities (CRUB) in 1970. It is part of a research project sponsored by CNPq, called "Architecture, urbanism and education: Brazilian university campuses", which was coordinated by Gelson de Almeida Pinto, architect and university professor (EESC/USP), and supported by Ester Buffa, Education historian and university professor (UFSCar). This research focuses on the establishing of the first universities in the medieval Europe, in countries such as France, Italy and England. After, it shows how universities introduced the concept of University City or university campus, it means, a special city located in the country. This idea came to Brazil in the 60's and it has influenced the planning of Brazilian universities since then. In this way, this paper relates the higher education policies, conceptions, models and their functions to the planning of physical space for a campus settling, that involves questions concerning architecture and urbanism.

**Keywords:** architecture, urbanism, planning, university, campus, higher, education

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Gelson de Almeida Pinto,<sup>1</sup> Ester Buffa<sup>2</sup>

<sup>1</sup>Department of Architecture and Urbanism, University of São Paulo, Brazil

<sup>2</sup>Department of History of Education, University of São Paulo, Brazil

**Correspondence:** Ester Buffa, Department of History of Education professor at UFSCar, University of São Carlos, CNPq and FAPESP, Brazil, Email [ester@ufscar.br](mailto:ester@ufscar.br)

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## Introduction

This article analyzes the Manual for Integral Planning of University Campus, written by Rudolph Atcon and published by the Council of Rectors of Brazilian Universities (CRUB) in 1970. It is part of a research project sponsored by CNPq, called "Architecture, urbanism and education: Brazilian university campuses", which was coordinated by Gelson de Almeida Pinto, architect and university professor (EESC/USP), and supported by Ester Buffa, Education historian and university professor (UFSCar). In this research we follow this way: initially, we focus on the establishing of the first universities in the medieval Europe, in countries such as France, Italy and England. After, we show how universities introduced the concept of University City or university campus, it means, a special city located in the country. This idea came to Brazil in the 60's and it has begun to influence the planning of Brazilian universities since then. In this way, we have always tried to relate the higher education policies, conceptions, models and their functions to the planning of physical space for a campus settling, that involves questions concerning architecture and urbanism.

Thus, we can emphasize two periods in the Brazilian higher education evolution, according to our purposes. The first one began with the creation of the first isolated colleges in our country, about the settling of the Portuguese court in Brazil, passed through the creation of the first universities, between 1920 and 1930, and went on until the 60's. It is possible to affirm that in this period the conception of a higher education called traditional or humanist was predominant. It aimed to give students a general formation in order to prepare them to liberal arts as well as to educate them to be intellectual leaders. In the second period, which began in 1960 with the Military Coup and after with the University Reform of 1968, the Brazilian university model became another. It involved, then, the development of education and research inside the university in order to reach technological and scientific outgrowth. Thereby, it should promote the economic development of the country. At this moment, the university campus model was adopted: the university is far from the city, the campuses are built in the suburbs, keeping an ambiguous relationship with it – at the same time in which the campuses depend on the city, they reject it most of the time. The mentioned publication by Rudolph Atcon,

about the university campus, which has been influencing on the planning and building of campuses, reflects the great transformations occurred in the Brazilian higher education during this time. Rudolph P. Atcon, who was known by the Brazilian education scholars mainly due to the Atcon,<sup>1</sup> was born in Greece, but was naturalized as a North American citizen and has been in Brazil between 1953 and 1956. During this period he provided services to CAPES, agency of the Brazilian Ministry of Education. After the Military Coup, in 1964, Atcon returned to Brazil, at the moment in which the first agreement between MEC and USAID (1965) was signed in order to organize the Team of Supporting to Planning of High Education. Afterwards, he was hired by the Higher Education Directorship, with the objective of proposing structural changes that were necessary, in his point of view, to Brazilian universities. Atcon, who had already visited universities in other countries in Central and South America and had worked in the University of Concepcion, in Chile, has visited 12 Brazilian universities in four months. Then, he proposed, as an advisor, some measures based on his diagnosis, that were supposed to be implemented for a reorganization called Brazilian university modernization.<sup>2</sup>

It is well known that the Atcon Report as well as the Meira Mattos Report (1968) subsidized the University Reform of 1968, that was made under the protection of the Fifth Institutional Act (AI-5) and the 477 Decree to solve what was called Student Crisis. For the Brazilian higher education modernization, Atcon proposed, apart from other things, that the university management would be like one of a big company, with a direction recruited among the businessmen and unlinked to people involved with scientific and academic life. Rationality, efficiency and productivity should be the most important words in the restructuring of the Brazilian university, even concerning the planning and building of campuses. But the Meira Mattos Report, worried about the lack of discipline and authority showed by the student manifestations, recommended a new managerial and disciplinary order. It proposed a reform that would make the university an instrument of country development acceleration.<sup>2</sup> The Manual for Integral Planning of University Campus, written by Rudolph Atcon, expressed the conception of university that he defended and it was approved and published by the Council of Rectors of Brazilian Universities (CRUB) in 1970. The CRUB was created in 1966, as

a civil institution of private rights. Its headquarters was in Rio de Janeiro and later it was transferred to Brasília. It gathered rectors of Brazilian universities who were performing their job attributions. Miguel Calmon, from the Federal University of Bahia (Universidade Federal da Bahia), was the first president and Rudolph Atcon was the first executive secretary of the CRUB.<sup>2</sup> The Manual for Integral Planning of University Campus by Rudolph Atcon was a short book, published with format 14cm X 21cm and 117 pages. It contained text, 13 pictures or drawings of his proposal, summary and the author's introduction. There is no bibliography.

The book is divided in 10 chapters, such as the following:

- a) Introduction—it shows the origin of the text, its objectives and history. Each one of these items contained subdivisions. We found out that this text was ordered by the CRUB and its author have already produced documents, analysis and definitions, that had the objective of characterizing the contemporary university, as well as showing the path to restructure the traditional university or a transition university in order to make it “integral”.
- b) Mission—the text shows in several sub-items the general goals (education, extension, research and civism), the values, the unit (the integral university is an organism) and the specific higher education objectives (general higher education, education and non-specialized training, education and professional training, development and specialized training, scientific research, specialization courses and university extension).
- c) Definition—it focuses the common vocabulary, the structure and management of academic divisions.
- d) Projection—it deals with the integral university, the integral planning, the planning committee and the quantitative planning.
- e) Location—it focuses technical terms, needs, procedures and acquisition.
- f) Urbanization—it shows the technical office, the specific studies hiring, the general urbanistic planning, the urbanist's role and the need for this kind of professional.
- g) Zoning (or zonification)—after the demonstration of the basic principles, it deals with different centers, sectors, places for gathering and conclusions. It predicts seven centers: Biomedical, Sportive, Agronomics and Cattle, Cybernetic, Artistic, Technological and Basic. Among the places for gathering are the library, sports, university house, theater, hospital and central administration.
- h) Building—this item deals with the basis, principles, typologies, permanent buildings, noise, building planning and intendency.
- i) Inhabitation—among other things, it focuses the inhabitation policies, the contemporary history and reality, the inhabitation management and the autonomy versus extra-territoriality.
- j) Epilogue—it shows the applicable principles of the integral university, the transition university, the specialist and the systematic planning.

As it can be seen, the ten chapters involve several aspects related to the planning and building of the university campus.

These aspects arise from the conception of a university defended by Atcon, which he considers very different from the university that

exists in several parts of the world, including Latin America and Brazil. This university is called traditional, it means, it included a number of schools and professional faculties, that were isolated and worked as administrative, didactic, financial and personal autarchies. The transition university demonstrates some level of development, comparing to the traditional university, mainly concerning structure and administration between their academic and scientific centers. Eventually, the integral university is an institution in which teaching, research and extension are completely inter-related. These three institutional dimensions support all the offered careers, in a central administration that serve to activities and not to unities.<sup>3</sup>

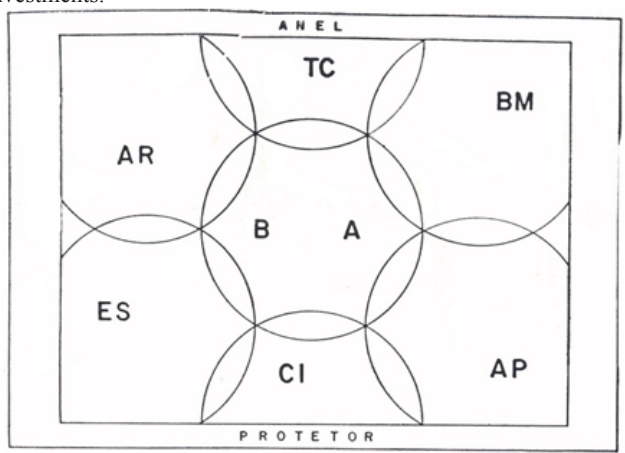
The Manual aimed to guide the implementation of the university reform, recently created (Law 5540/68) and the integral planning of university campus, that had already been built or that would be built since then. In Atcon's words: this manual concerns the systematic planning of one university campus, that is, a geographic place, which gathers all the activities in a university and integrate them in a more economic and functional way. It means, there is an academic-scientific service, coordinated and with a maximum span. It respects its limitations and human resources as well as its technical and financial ones.<sup>3</sup>

Furthermore, the Manual explains what its author understood about university campus, which, according to him, differs from the University City, once it corresponds to a traditional university—it gives, in only one geographic area, a physical expression of desire for uniting the isolated and distant centers that make it up. Anyway, it does not surpass a simple approximation of buildings that house independent autarchies. According to Atcon, the University City or traditional university would be that in which autonomous colleges are installed in big isolated buildings. Moreover, they are distributed in a large area that could or not be urban and come together with the administration and the services that make the complex up. In his opinion, the aspiration of the first universities was to be a region separated from the “addictions of traditional cities”, but that still could keep its comfort. Thus, it would be a privileged place for teaching and research. For Atcon, this conception was a waste, because it was an area without a strict planning, made up of monumental buildings. Most of them were useless, expensive and set up in locations that were bigger than the real needs, taking into account the exaggerated autonomy and the complicated administration. Emphasizing the mistakes of this option, Atcon states that those people, who entitle themselves to deal with forces that they do not know and can not control, have been the authors of expensive and anti-functional buildings that they can not produce. These buildings can not be built because they weren't done with an aim, neither as isolated buildings nor as an inter-related and inter-dependent set of buildings, in order to achieve the aimed productivity.<sup>4</sup>

The campus, on the other hand, would be a homogeneous and closed set of buildings, much easier to control and manage, according to Atcon. It would be strictly planned, based on a didactic structure quite different from those of isolated colleges. Thus, this structure could facilitate the rationalization as well as low costs of building, administration and control. It is important to emphasize the author's distinction between University City and campus. Atcon reveals a conception and a model of university that would be rational, functional and productive (Figure 1).

The campus proposed by Atcon, in his Manual, should be thought and built following a detailed planning, in a rational way, in order to

achieve its also rationally defined aims. Concepts such as meaning, expressive and mainly appropriate are not present in his plan. Contrarily, Atcon define rules that include the land acquisition and its urbanization, as well as the definition of standards and typology of the buildings and its zoning, it means, the most appropriate organization to locate the several buildings in a campus. For choosing a land, the author suggested an area of 500 hectares. From these, 200 hectares would be used to build seven centers, which included administration, services, circulation, parking and related activities. The rest of the area would be used to any other need, such as the creation of new courses and even a future investment: as the university exists and grows, it increases the value of an entire area. This advantage must be useful also to the university itself and not only to its neighbors. If the university, in the future, concludes that it does not need all the available land, its value always can be transformed into profitable investments.<sup>5</sup>



**Figure 1** Outline for setting several sectors in a campus, according to the rules of Atcon's Manual.

BM, Biomedical Sector; ES, Sportive Sector; AP, Agricultural and cattle Sector; CI, Cybernetic Sector; AR, Artistic Sector; TC, Technological Sector; BA, Basic Sector.

Atcon explains also that the investments can be done by selling or building sources of income in these lands. The universities created during the Foundation regime, for example, UnB and UFSCar (1970), anticipated the possibilities for getting extra budget sources. The Manual anticipates concerns and propose principles for the land choice, like creating a dense arbor in the form of a ring around the campus, near to the own buildings. This way, it would be possible to control the academic scientific environment and the kind of neighborhood. It proposes the detailed data collection, such as maps, topography, legal conditions and even the most suitable criteria to select the best option for acquiring the land, among the possible ones. It claims that the best solution is always trying to get the area through donation. The building of enterprises relatively distant from the urban centers is an old practice, adopted by businessmen who are interested in real estate speculation. As these areas are occupied, the government inevitably widens the basic resources (electricity, asphalt and sanitation) up to the place. This action increases the value of the area and also of the corridor that leads to it. This is a classical type of real estate speculation. Somehow, Atcon proposes the same procedure for defining the area and the building of new university campuses.

The following measures were proposed in the Manual and refer to the beginning of the occupation of the area. In order to make it

possible, Atcon recommends hiring an urbanist, but warns about the fact that not all urbanists are able to the job. It is necessary that the campus urbanist, a rare professional in the world, be committed to follow strictly the principles and concepts from his Manual.<sup>5</sup> From this point, the formation of a Technical Office that is under the control of the sub-rector of Academic Issues and a Planning Committee is advisable. It would be an office formed by professionals of several areas related to the campus setting and building, but with a limited autonomy for determinations and decisions established by the Planning Committee and the sub-rector. Thus, this would be a predominantly technical office, without the possibility of taking decisions and independently of its professionals' expertise. The definitions and the allowance for the works developed in this Office are a task that belongs to another decision sphere, in which there may not be specialists during all the time. Decisions are taken by political and financial criteria and are independently of the specialists' proposes. Anyway, these professionals must answer technically the established decisions. Hiring an urbanist seems to be a simple formality. But, according to the Manual, he would be a kind of consultant that could give suggestions or even approve defined proposals. For example, Atcon shows, in the Manual, several detailed diagrams about how an efficient zoning of the campus would be. In a rectangle that would hypothetically represent the area of the campus, Atcon draws his intentions. Along the area, a hedge of approximately 10 meters would be a green barrier that could define the campus limits, separating it from the occupation around and delimitating its region clearly. The demarcation of the area and its hedge would have also the function of distancing the undesirable visitors and creating an acoustic barrier, which could attenuate the outside noises. They would interrupt the activities and the internal concentration. At the rectangle's sides, Atcon strategically created four sectors: Biomedical, Sportive, Agricultural and cattle and Artistic. The option seems to get a better permeability among these sectors and the city, mainly the Biomedical Sector, in which there are a hospital and the Sports Sector. In these positions, only one entrance would be enough to permit the access to each sector and it wouldn't give visitors the opportunity of circulating through the rest of the campus.

In among these areas, which are distributed to the location corners, would be, by one side, the Technological Sector and, by the other side, the Cybernetic Sector. Right in the middle of the land, Atcon proposes to set his Basic Sector, which is formed almost completely by classrooms, where the students should attend their initial disciplines. After this phase, they would be taken to their specialized sectors (Figure 2). The Administrative Sector should be located in the center of one of the longer sides of the rectangle, almost as part of the Cybernetic Sector. This is an option that allows the constant use of information technology equipments and services. Between the Biomedical Sector and the Agricultural and Cattle Sector, in the shorter side of the rectangle, there would be the University House, a meeting place for students and professors. Atcon creates six important points, located at the sides of the rectangle: Hospital, Theater, Sports, General Services and Administration. In addition, the Basic Sector building is set in the center. All these buildings would make part of a set called "permanent buildings". For designing them, Atcon gave some freedom of action to the architects. Besides, libraries, restaurants and other services would make part of this permanent building set. The other buildings would have a more provisional state, with flexible characteristics, that could be changed or widened depending on the needs. Thus, Atcon explains his concept of "flexibilization" for this set of buildings (Figure 3).

The buildings must fit the principle of maximum elasticity, concerning their use, reduction or modification:

- a) defined architectonic buildings do not fit this principle, because of their internal and external strictness
- b) architectonically, only fluid systems are useful for a university
- c) any kind of building freezing is harming and useless for a university.

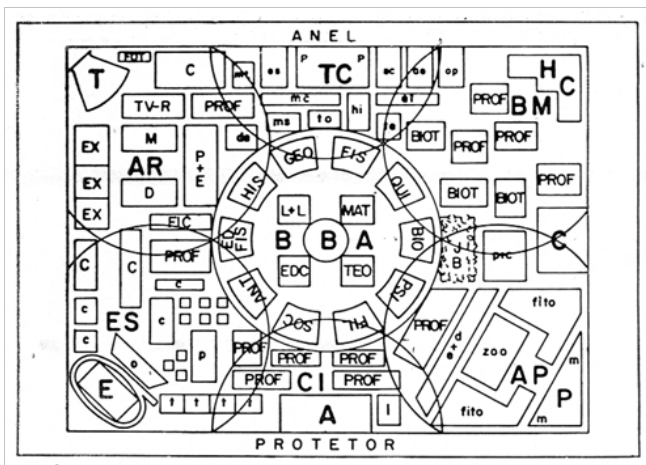


Figure 2 After this phase, they would be taken to their specialized sectors.

BM, Biomedical Sector; ES, Sportive Sector; AP, Agricultural and cattle Sector; CI, Cybernetic Sector; AR, Artistic Sector; TC, Technological Sector; BA, Basic Sector; A, Administrative Sector; HC, Hospital; T, Theater; E, Sports; P, General Services.

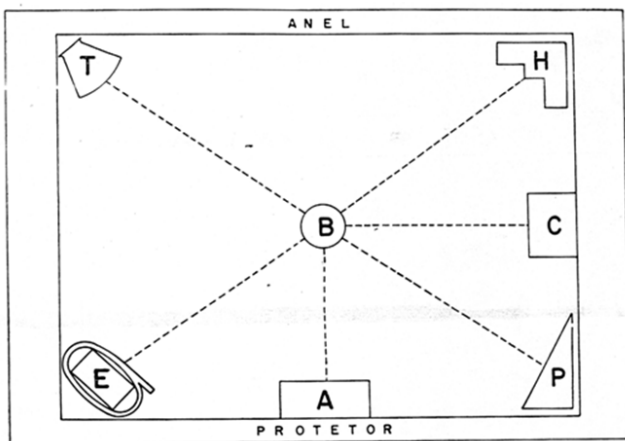


Figure 3 The buildings must fit the principle of maximum elasticity, concerning their use, reduction or modification.

BM, Biomedical Sector; ES, Sportive Sector; AP, Agricultural and cattle Sector; CI, Cybernetic Sector; AR, Artistic Sector; TC, Technological Sector; BA, Basic Sector; A, Administrative Sector; HC, Hospital; T, Theater; E, Sports; P, General Services.

It is quite important to emphasize the similarity between the drawing proposed by Atcon and the plan of a medieval village: four guardian towers, one in each end of the wall, and a main road. In this case, the administrative building, big and majestic, is what gives the main access to the set of buildings. Much more interesting is to perceive this similarity and its outlines for setting the buildings—

sectors, departments, laboratories, classrooms, etc.—inside the campus. Atcon defines regions by using archs of circumferences. The buildings are set from the center of these archs, following their lines (Figure 4).

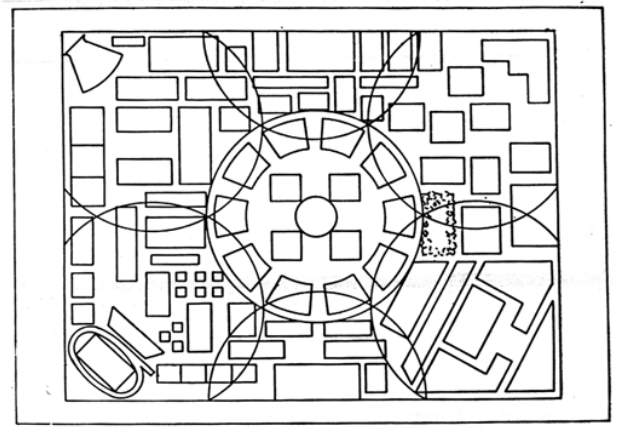


Figure 4 Diagram showing all the areas of the campus and its respective buildings.

The rationality is clearly shown in Atcon's discourse and disappears along the complex plan of his urbanistic action. It concerns a diagram that makes visible his proposals. In it we can see clearly his real problems; it is a confusing drawing that, when imagined in three dimensions, can be even more complex. It doesn't show clear references for the user to locate himself when walking through the sinuous roads. The campus is totally based on rational actions and becomes a confusing village, quite difficult to circulate and only good for orientating those who know it well. It is transformed into a building mess without a meaning, with a building next to another, few contemplation, fruition and rest areas, which can allow the set to breathe. This is the Atcon's studying and researching machine. The zoning or, as Atcon calls it, zonification by knowledge areas was not a novelty in the Brazilian campuses projects. Since the first projects for the University of Brazil (Universidade do Brasil), in Rio de Janeiro, the committees responsible for defining the project program have already proposed the division by regions. The fundamental difference is that urbanists and architects had the freedom of designing a project based on the program. The proposals, in this case, are different one from others, but always bring creative results. They are harmonic and symbolically characteristic, it means, the opposite of the possible results in a campus that would be projected following the Atcon's guidelines.

It's important to emphasize that the first campus in Brazil were designed and built before the University Reform of 1968. Each school was a college that had spaces, equipments and services, which made them work autonomously. Some buildings at University of Sao Paulo (Universidade de São Paulo) are a good example of this phase. Buildings such as the Medicine, Architecture and Urbanism colleges or even the Escola Politécnica still work like this. They are big buildings, architectural milestone that are able to promote their activities by themselves. They are part of the Brazilian History of Architecture for their evident architectural importance. This would never be possible in the Atcon's proposal, nor even after the University Reform of 1968. Thus, the colleges were converted into Institutes, Centers and its departments. This change resulted in a different configuration of the new campuses from this stage. The

buildings became smaller, compact and many activities began to be divided by several departments and centers. The Center began to play only an administrative role and the departments linked to each Center included professors', meeting and directors' rooms as well as a specific department office. The classrooms were distributed to the centers in the campus, for group use. The laboratories were gathered in order to assist several departments in a same center. Then, what was housed in one building was divided into smaller and simpler ones. In summary, it is possible to conclude that all the Atcon's proposals for planning and building a university campus were based on a model of a university for teaching, researching and extension. Its focus on the scientific and technological development would lead to the economical development of the country. This was called the Brazilian university modernization. It was a term used by Atcon, who created it during the University Reform of 1968 (Lei 5540/68), exactly in the period of Military Regime. Based on technocratic ideas and the theory of human capital, the military governments considered the education as an investment in human resources. This conception fitted quite well to that stage of economic and social development, which offered jobs to those people who possessed diplomas, mainly higher education ones.

Thus, the Atcon's proposal focused on a functional relationship among the spaces and buildings in the area of the campus. The buildings that have more contact with the city are set at the sides of the campus, or are strategically set in each one of their angles. Right in the center of the area, the Basic Center was set, protected from noises. Around it, the departments and laboratories were built. There was always a care for gathering similar set of buildings. This is functional solution but it does not show any worry about the land, its topography and even the possibilities for drawing a campus that can offer more than functionality. For Atcon, the land is an abstract plan where his diagrams are stuck. It is a village protected by an arbor in the form of a ring, independent from the city, although this area is inside it. It is a place for privileged people, working like clockwork. All proposals that may contain any poetical inspiration are discounted. There is no possibility to relate the spaces according to their topography or to build more sophisticated and socially enjoyable environments, which could allow the interrelation among different kinds of knowledge. The drawing by using rule and compass, as well as the proposed diagram are abstract and uncommitted with the Architecture, the Urbanism and even the teaching. It reveals a slight rational and functional intention of Atcon's campus conception, which gathers people and the most different activities. In short, it was a studying and research machine dedicated to itself and that had its back to the city.

Naturally, no space for teaching needs to be sophisticated. The history of school and even the everyday life show us examples of the teaching and learning process that are done under the worst conditions. This can happen as in precarious environments as in sophisticated ones. In the medieval corporations, the apprentices had the least used spaces at the shops. Itinerant masters offered their lessons in small spaces in the buildings, which were made of stones and clay. Images of monasteries show students sat on uncomfortable benches. Today, we still see adapted classrooms that have no comfortable and healthful conditions. Blackboard and chalk keep on being essential resources for teaching and learning. That situation could be different if it depended only on the development of teaching activities made by educators, architects, industrial designers, programmers and even by the didactic materials and information industry. Since the moment in which the school has become a place (with the schools of the XVI century), architects and engineers began to turn their attentions to the

building. Joiners and, later, industrial designers have been offering equipments and furniture that can make the teaching easier and more dynamic. The recent and fast media evolution, mainly the electronic one, has continuously transformed, widened and made easier the teaching and learning activities. Professionals from different areas try to promote ideal conditions to make the complex teaching activities in all the education levels, as well as in the research. For some reasons, in the university campus it is possible to detect a constant worry about the quality of equipments and space.

However, it is of fundamental importance to emphasize one aspect: every effort to create and plan which were observed in the project and building of university campuses in Brazil are distant from the Manual that we have just presented, fortunately. For Atcon, efficiency and functionality are the basis for the diagrams and the campus plan that he considers as suitable. It concerns a regular space, repetitive as in the formal solutions for the building as in the free spaces. Most of the time, these spaces are rests of spaces between one building and other. They are called non-spaces. The architects, urbanists and engineers' assumptions are different. There professionals project campuses and worry about the users' welfare, their comfort, social relationships, the building of enjoyable spaces and the symbolic value shown in the buildings. There is a variety in the form of the buildings, spaces and environments that promote a favorable atmosphere to the various activities of the campuses, which are not restricted to teach, learn and research.

Contrary to this, the Atcon's planning of university campus shows an absence of environment diversity, the austerity of the buildings, the lack for care with the areas near to the buildings and the exaggerated worry in isolating the campus from the city that is around it. All these aspects transform the campus into a passing by place, where the students, professors and employees stay only time enough to accomplish their tasks, as the Atcon's diagram proposes. Eventually, it is impossible not to think that the principles which inspired the University Reform were originated only from the Atcon and the technocrats' ideas. In fact, the University Reform of 1968 has consecrated some organizing principles that had been experienced before, in another context and with other directions. Actually, after the World War II, the university has begun to be seen as a strategic way of producing knowledge to promote scientific, technological and economic development. In the global scene, the atomic bomb and the launch of the first rocket showed the importance of the research for the scientific and technological development. The scientific research developed by research teams has been seen as one of the main functions of the university. During this time, several scientific institutions, that is, fellowship institutions were created. Some examples are CNPq (1951), CAPES (1951) and FAPESP (1962). In 1948, the Brazilian Society for Scientific Progress (SBPC) was created by scientists that fought for the scientific progress in Brazil.

It is important to take into account that in the 50's and 60's, Brazil has been experiencing the national development movement. Thus, the country development would be possible by replacing importations with industrialization. The political and ideological conflicts were intensive. Students hold marches in favor of the university reform (for more investments and places) and of others called "base reforms". Certainly the Reform of 1968 did not achieve the results aimed by these social forces. In 1947, the Technological Institute of Aeronautics (Instituto Tecnológico da Aeronáutica-ITA), in São José dos Campos, was created. It was recognized for its didactic and academic structure

and has become a reference to other higher education institutions, which were interested in research. Among these institutions was the University of Brasília (Universidade de Brasília). The Technological Institute of Aeronautics has shown an innovative curricular structure: instead of cathedras, it adopted departments; the students attended obligatory and optional disciplines. The university offered a basic formation that was complemented by a professional formation.<sup>6</sup>

The great milestones of the new university model, which integrated teaching and research, were the creation of the University of Brasília, in 1960, and the State University of Campinas (Universidade Estadual de Campinas - UNICAMP), in 1966. These institutions are older than the University Reform of 1968, but it has adopted, with other ideological principles, that model of organization, teaching and research, as well as a new way of planning and building university campuses. The campus had to fit the model proposed to the new times and higher education needs. But this is another matter.

## Acknowledgments

None.

## Conflicts of interest

The author declares that there are no conflicts of interest.

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