Transformative pedagogy at the University of Ngaoundere: the development of classrooms in bus to collaborative, island, U-shaped or flexible bus?

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Abstract: The classroom, a codified space which highlights the relationship between spatial arrangements and pedagogical practices, is a geographical object which is not studied enough. Educational policy impacts these mobilized spatial devices, including postures, indoor movements, the circulation of knowledge and the development of skills. Indeed, this article aims to evaluate the effectiveness of the classroom arranged in rows of bus seats which allows the polarization of learners' attention towards the blackboard and the teacher's desk. The authority and dynamic of frontal speaking are thus established. But, with active pedagogy which puts the learner at the center of their learning and transformative pedagogy which aims for the laudable transformation of the learner's daily life, it is clear that the way of teaching, evaluating and learning, has evolved. Consequently, arranging the classroom necessarily takes into account these educational changes, the central question of which is: which table-bench arrangement to choose in a classroom based on the teaching method? Should we continue with the traditional row arrangement, appreciated by a large number of teachers and which facilitates classroom management? Or should the table-benches be arranged in the shape of a U or double U and which allows learners to see each other, to debate while looking at each other, to challenge each other, thus making the teacher, the Guide, the mediator? of their debate? Or should tables and benches be arranged in islands to allow learners to work in groups on reflective exchanges and thus encourage the establishment of educational differentiation? To achieve this, an analysis of the speeches of twenty-eight learners from various backgrounds and levels, forty teachers, thirteen academic leaders from faculty establishments and schools of the University of Ngaoundéré, a reading of UNESCO Reports, a documentary analysis on the theme and a quote for the local manufacturing of ergonomic white tables were carried out. We will consider transformational learning theory to understand the evolution of classrooms.

Keywords: Transformative pedagogy, bus classroom, U-shaped classroom, island classroom, University of Ngaoundéré.

Introduction

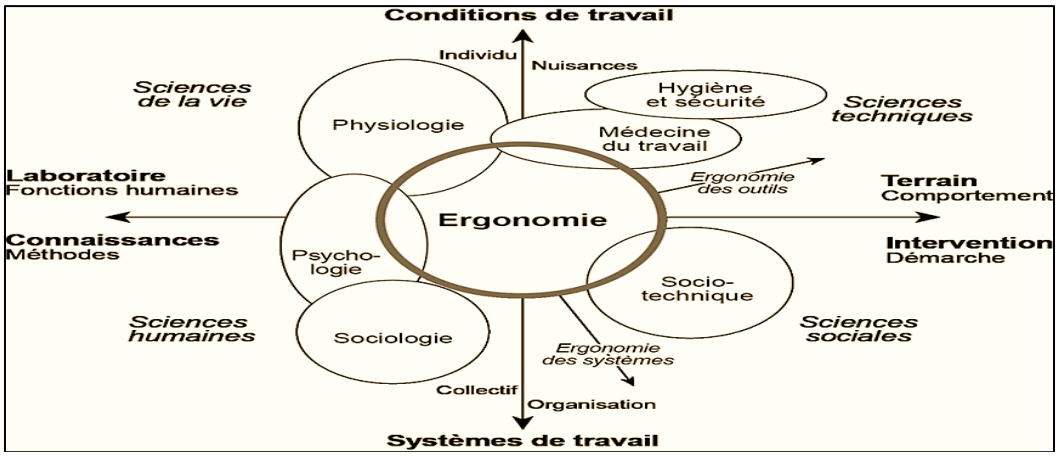
The organization of classrooms in “bus”, “Island”, “U”, “Double U” or “flexible bus” meets very specific educational objectives. The pedagogy that the teacher adopts in the classroom is influenced by the typologies of learning spaces (Thornburg, 1999). This arrangement of classrooms which reinvent themselves, for dynamic teaching, learning and assessments (Amigues, 2003), is therefore not done haphazardly. The flexibility of these rooms has a positive impact on improving the performance of trainees and the comfort of Trainers. It is in this sense that the ISO Standard 5970:1977 poses as a basic principle: “seats and tables in classrooms must be designed in such a way as to promote the correct postures of all those who use them in educational establishments. training”. While presenting the seven sizes of furniture (table-benches and seats) with anthropometric references that an establishment focused on new pedagogy will have to adopt, the ISO 5970 Standard leaves a possibility for local Designers and Manufacturers to adapt this furniture to the endogenous economic-technical conditions thus facilitating the permanent interrelation between students, furniture and their teachers (Gagné, 1965). This Standard therefore recommends that States carry out a SWOT analysis in order to adapt local needs to the sizes of furniture prescribed by ISO 5979 as well as to the available budget. Clearly, at the University of Ngaoundéré or elsewhere, the traditional bus arrangement which does not allow for collaborative work between learners, is increasingly criticized, thus reflecting a weak commitment to ergonomics (Delvolvé, 2010).

New pedagogy, the advent of the Internet, the globalization of education, have given rise to increasingly growing demands for table-seat ergonomics in classrooms which thus offer a multifaceted learning space. (Tardif, 2000) centered on the learner. Academic failure is now considered "an intolerable economic waste" (Rieunier, 2019) by States which are committed to a posture of Management Focused on Quality or even, a pedagogy based on the qualitative transformation of teaching, learning, evaluation for real performance of the structure. The process approach (Brule and Séchaud, 1997) is effective "to ensure that all learners succeed or to leave as few as possible behind" (Rieunier, 2019). From Maria de Montessori to Skinner via Rogers, Ausubel, Bruner, the flexible classroom, unlike the room whose furniture is arranged in a bus, is gaining value. Ergonomics in classrooms therefore has a direct impact on the qualitative learning outcomes of learners because they are comfortable in a learning environment which allows them to be mobile, active and dynamic. Their concentration is thus maintained throughout the course and they assimilate the lessons better. Today, many learners encounter behavioral difficulties (Doyon, 2018) in classrooms: incessant chatter, lack of concentration, limited autonomy, etc. For many specialists in the spatial layout of classrooms and certain knowledgeable educators, the layout of classrooms has a share of responsibility for these disturbances caused.

In this case, the partial solution would be found in the ergonomics of the classroom. However, we are increasingly seeing that within the Cameroonian higher education space, the majority of public establishments, ergonomic parameters are often neglected in classrooms for multiple reasons such as their lack of awareness of the importance of ergonomics on the qualitative academic performance of learners or like their knowledge of this importance of ergonomics but the need to save money prevails. Hence the importance of our present article which highlights the impact of the organization of the space of a classroom on the learning, attention and behavior of learners. Our article is in fact entitled "Transformative pedagogy at the University of Ngaoundéré: from the layout of classrooms in buses to collaborative ones, island, U-shaped or flexible bus?". The problem therefore arises of the relationship between transformative pedagogy and the ergonomics of furniture design in classrooms at the University of Ngaoundéré. In other words, what link is there between transformative pedagogy, the arrangement of tables and benches in classrooms and the performance of students at the University of Ngaoundéré? How does the arrangement of spaces and tables influence the behavior of teachers and learners in the classroom? Do the current arrangements in this university institution make it possible to provide, support, enrich and improve the diversity of activities emanating from lectures given by the teacher, teamwork done collaboratively between students themselves under the guidance of the teacher and the execution of individual educational tasks by the latter? Among the seating arrangements as part of the layout of the learning space, which ones should be valued for efficient and effective transformative education at the University of Ngaoundéré? Do transformative teaching, learning and assessment (Mezirow, 2000) have the ergonomic space that suits them at the University of Ngaoundéré?

The objective of our article is to show the role of Ergonomics in the laudable transformation of the working environment of Teachers and Learners who spend many hours in this school environment. Ergonomics (Figure 1) will also make it possible to detect malfunctions by proposing remediation. For example, the working conditions of learners who get up early to be on time at campus, to spend around eight hours of classes sitting in an environment where noise distracts their concentration, without naps but with mini breaks, constantly looking for grades, absence or insufficiency of didactic learning tools, etc. As for Teachers, they are constantly learning, they work constantly in noise, absence or insufficiency of work space, fragmentation of working hours, absence or insufficiency of technological tools such as the printer to print teaching materials, the photocopier, camcorder, etc.

Figure 1: Benefit of Ergonomics in the Classroom.



Source: Google search engine.

I- Research methodology for the production of this article.

For the collection of empirical data, we opted for an internal survey at the University of Ngaoundéré and an analysis of the standard reference framework which deals with school infrastructural governance. This allowed us to take stock of the practices of transformative pedagogy in connection with the layout of the classroom space. To achieve this, we used a mixed methodology focused on the qualitative method and the quantitative method. We conducted focus discussions with students and we conducted semi-structured interviews with a few people who are part of the teaching staff of this university institution. Therefore, our data collection instruments are: observation, interview, questionnaire and documentary research. We will therefore outline the content of our work before carrying out a transversal analysis of the data collected during the discussion of our results obtained.

II- Learning spaces at the University of Ngaoundéré and effective educational affordance?

It is important to present the layout of the classrooms that exist at the University of Ngaoundéré before expressing ourselves, based on the field data collected, on the need for this university institution to meet national and international quality requirements.

A. Classic arrangements of learning spaces at the University of Ngaoundéré

We will present some existing provisions in schools such as ESMV (Figure 2) and in Faculties such as FSJP (Figure 3) and FSEG (Figure 4) at the University of Ngaoundéré We will present some existing provisions in schools such as ESMV (Figure 2) and in Faculties such as FSJP (Figure 3) and FSEG (Figure 4) at the University of Ngaoundéré.

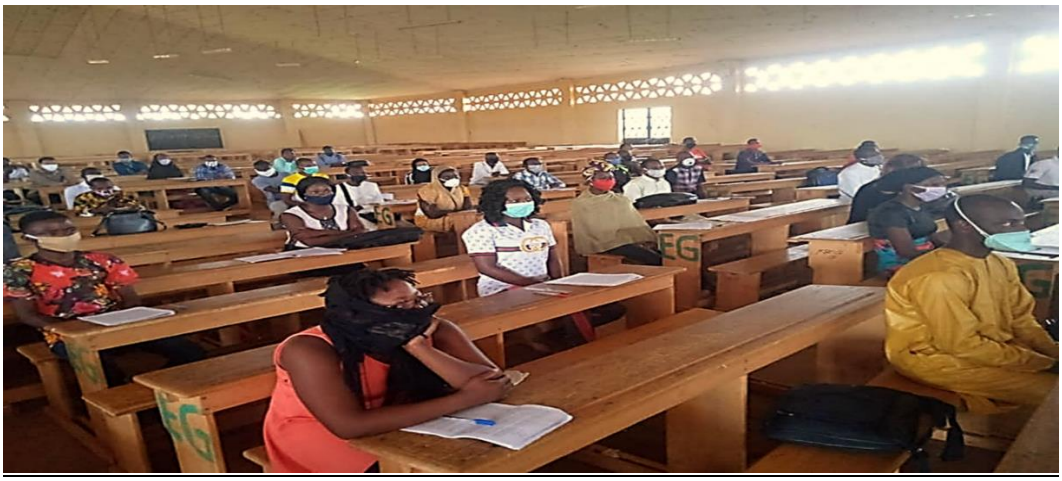
Figure 2: Bus and chevron layout at the UN ESMV.

Source: Archive of Dr. Aïcha Mohamadou, 2023.

Figure 3: Bus and chevron layout in one of the rooms of the FSJP of the UN.

Source: Archive of Dr. Aïcha Mohamadou, 2023.

Figure 4: Bus provision at the UN FSEG.



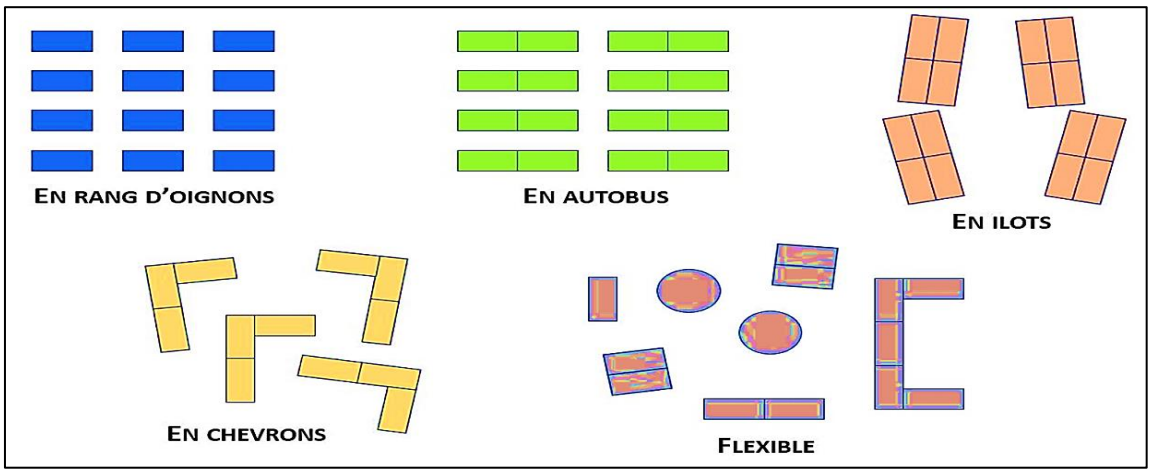
Source: Archive of Dr. Aïcha Mohamadou, 2023.

With this classic bus or onion row or chevron layout, teachers in these classrooms are like the sun overlooking the ocean where they have full visibility of the classroom. Learners do not need to crane their necks to see the board. This greatly reduces the sources of distraction since in their field of vision, there is the teacher and the board. The bus model promotes the individual concentration of learners, particularly those seated at the front who have a clear view of the teacher to the detriment of those seated at the back of the room. As an advantage, the teacher has easy management of the class and as a difficulty, this model does not promote interaction between learners. Note that with the U model, collaborative learning is reduced, hence the risk of medium-term disengagement of learners who quickly tire. Clearly, this classic configuration facilitates concentration but requires the teacher to follow all of the chatter and identify those who follow it or who do not follow it. This vision is considered a kind of educational parasite for those who prefer other classroom arrangements (U-shaped, double-U, etc.) which result in more motivation and learner autonomy.

B. Other learning space arrangements for successful transformative teaching

The seating arrangement must align with the specific learning objectives because, "The way of organizing the space is linked to the pedagogy advocated by the Teachers" (Kessler, 2017). Indeed, the learning space is a place dedicated to the different forms of learning knowledge and socialization of the people who frequent this place. There are several types of learning space layout depending on the educational intentions (Leroux et al., 2015). Seating arrangement is the way chairs and tables are placed in a classroom. There are therefore several organizations of the learning space and seating arrangements linked to the educational intention and method. Thus, the organization of the classroom "in a bus" (Figure 5) allows the transmission of knowledge head-on, the control of the class by the teacher and the fixed concentration of the learners on the teacher (Clerc, 2020). The organization of the learning space "in islands", "in U", "in double U", "in flexible classes", "in nodes", etc., allows interactions and cooperation between learners and their teachers by promoting innovative learner-centered practices in an optimal learning climate. However, the success of this organization requires the motivation of teachers as well as their training in its relevant use.

Figure 5: Typology of learning spaces in a classroom.



Source: Archive of Dr. Aïcha Mohamadou, 2023.

For example, with the U-shaped and double-U layout, learners face each other (Figure 6). This allows them to dialogue and even communicate easily with each other. This arrangement is also favorable for the teacher who can easily move around each learner. The disadvantage with this arrangement is that when the teacher circulates in the center of the U, he does not have all the learners in his field of vision.

Figure 6: U-shaped and Double-U layout.

Source: Google search engine.

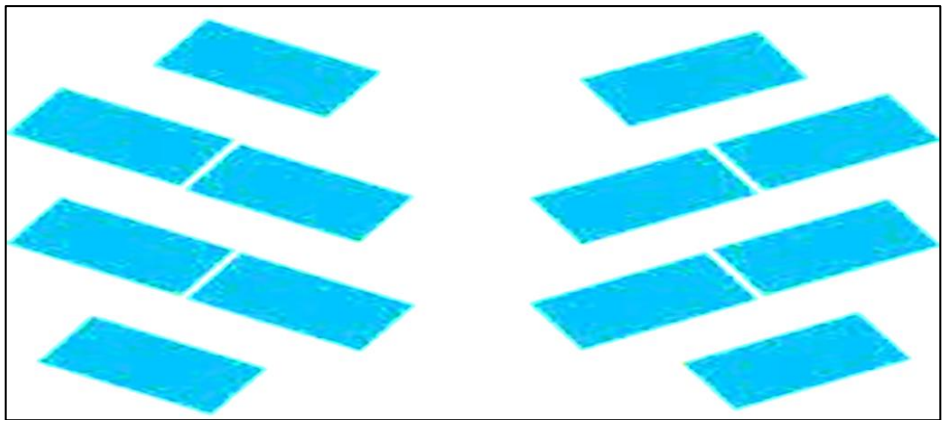
With the island or cob or bean arrangement (Figure 7), the teacher groups 4 to 6 learners around the same table for group work. This layout is ideal for projects and group discussions because they promote teamwork, peer learning, and idea sharing. This posture therefore allows the teacher to move freely between the tables and benches and facilitates their accessibility to their learners. This is not the case with the frontal posture of the bus form. This method therefore allows learners to find their place within a group, to get involved, to assert themselves and to gain self-confidence. Clearly, the arrangement in islands gives learners the opportunity to debate, argue, work on their orality in small groups, develop otherness, autonomy and taking initiative.

Figure 6: U-shaped and Double-U layout.

Source: Google search engine.

As for the herringbone/chevron arrangement (Figure 7), it harmonizes the traditional bus shape with the U shape. This allows learners to be oriented towards their teacher at the same time and to partially look at each other. This arrangement then facilitates interactions between learners as well as the possible easy movement of the teacher between the table-benches. However, this circulation between tables will be more difficult for the teacher if he is in a classroom with a large number of learners.

Figure 7: Chevron layout.



Source: Archive of Dr. Aïcha Mohamadou, 2023.

Clearly, regardless of the layout chosen, in a bus, in a U, etc., the organization of the classroom, or even the table-benches, is a control tool which responds to specific educational objectives which have nothing to do with it. of chance. This organization therefore leads to changes (Amigues, 2003) in the way of teaching, learning, evaluating and communicating. This is transformative pedagogy which is an innovative approach, aimed at transforming the learner through new teaching methods. It therefore takes into account the environment and the endogenous needs of the learner. Clearly, this pedagogy of transformation which aims to motivate the learner and lead him to question himself, to self-evaluate in his school environment, allows the latter to behave professionally. -active (Campan et al., 2010) in the face of change (Gagné, 1965). Faced with the multiple challenges facing the university governance of Ngaoundéré, it is wise to design teaching-learning with a view to transforming the learner and leading them to understand while adhering to this transformational change.

III- Ergonomics of space and transformative pedagogy: need to create a modular classroom space at the University of Ngaoundéré?

A. Contribution of ergonomics to the well-being and performance of students.

With ergonomics, we note an enhancement of the dynamics of the class in order to create an optimal learning environment for students unlike the traditional layout of classrooms. Indeed, with the onion or bus shape, learners who are placed at the back of the classroom are constantly distracted compared to those who are placed in front of them or in the middle of the room. Because the learner's location in a class has an influence on their concentration and participation in the course. Note that in 2010, studies carried out by Diane Bunce highlighted the fact that learners pay more attention to the teacher who allows them to participate directly in the course than to the one who adopts the pure transmissive method. Their study was done in the framework of active learning Reclaim Classroom Attention with Active Learning and How Classroom Design Affects Engagement learners. It is for this reason that the flexible class, that is to say, a class which offers several spaces depending on the different activities (group work zone, a debate zone or even a digital zone), is 'ideal for improving the learner's concentration, autonomy and adaptation. There is therefore a close link between spatial design and educational design.

Let us reiterate, academic failure, the gap between students who experience learning difficulties and those who do not experience these difficulties, the lack of concentration during lessons, chatter in the classrooms, absenteeism at school. courses, violence in educational settings, etc., constitute major concerns for specialists in educational issues. Combating these evils has led many States, through their Ministries in charge of education, to adopt palliative measures such as the reduction of numbers in classrooms following the ratio set by UNESCO, to proceed with the recruitment of more teachers than the construction of classrooms capable of welcoming these learners, to develop training in university pedagogy for newly recruited teachers/new CAMES orientations and the promotion of scientific teaching.

Clearly, one of the levers for resolving the problems of learning difficulty is the ergonomic arrangement of furniture in the classroom (Chavez, 1984) making it possible to establish an optimal learning climate via the mobility of learners. , their autonomy and their development. It should be noted that the types of arrangement of the learning space vary depending on the educational intentions. This arrangement of formal and non-formal learning spaces influences both the well-being of learners (Mazalto, 2013), their behavior or ways of being (Legendre, 1997) as well as their learning (Barett and al., 2015).

In other words, learning spaces are no longer limited to the formal space (classroom, amphitheater, simulation room, laboratory, practical work room, etc.) made up of units of time, activities developed and supervised by a teacher appointed by the establishment: it is a teaching space. There are also informal spaces (the cafeteria, the hall with comfortable chair, wifi, electrical outlets, sports fields, the library, the museum, the restaurant, etc.) made up of activities self-managed by the learner. collaboratively with other people or alone: it is an independent learning space. It is obvious that the most effective learning system today is dynamic teaching in an appropriate space that engages the learner's mind, but also their whole being, even their autonomy and motivation, 'where the improvement of his academic performance.

Educational technology (ICT) therefore has an important role to play in the successful development of flexible classrooms. The flexible class is a class that offers several spaces depending on the different activities such as a group work area, a debate area and a digital area, is ideal for improving concentration, autonomy and adaptation of the learner. It should be noted that seats and tables must be ergonomic for the well-being of students as well as for the easy transition of several learning methods. It is undeniable that students learn well and concentrate better in a comfortable classroom with furniture including table-benches with casters for student mobility, an ICT space for research, etc.

From the above, the pedagogical models which guide the teacher's way of teaching are impacted by the spatial layout in the classrooms. For example, the imprinting model (Martin et al., 2008) which has existed since the ancient period where learning consists of receiving knowledge given that learners are considered to have “empty heads”, highlights traditional pedagogy whose spatial layout of the classroom is that of a bus. The behaviorist model which has existed since the twentieth century where learning consists of modifying the behavior of learners, highlights the spatial layout of the classroom in the form of a chevron or in the form of a U. For the cognitivist model which was born in 1940 where learning consists of processing, interpreting and storing information, the constructivist model which began in 1950 where learning consists of constructing one's knowledge (Ourghanlian, 2006), the socio-constructivist model which has existed since 1960 where learning consists of building one's knowledge with others, the connectivist model (Goupil et al., 1999) which has existed since 2003 where learning consists of connecting elements via the internet tool, requires a layout of the classroom space in a double U, in the form of an Island, or in the form of a flexible class. A study was carried out by Kennesaw State University, in the United States, to show how the variation in teaching content through the use of ICT tools such as computers, video projectors, exercisers, etc., would promote long-term and effective concentration of students. It clearly appears that with the advent of the Internet, the globalization of education, the commodification of education which has a consecration with the GATS, that a close correlation exists between the conception of space design in teaching rooms and learner performance. The latter show has a tendency to stand out better when their environment adapts perfectly to their activities. With the flexible classroom (Figure 8), learners who move from one set-up table to another have an impact on their learning.

Figure 8: Flexible classroom space layout.

Source: Google search engine.

The adaptable seating arrangement provides a sense of control, allowing learners to be comfortable in their learning environment, thereby improving their comfort. Clearly, the adaptable arrangement of seats, or ergonomic seats, promotes variation in postures and can be adjusted to the learner's morphology. It has specific settings adapted to the learner's daily activity. The layout of space in the classroom varies depending on the type of teaching. Ergonomic seating and tables improve physical comfort, reduce discomfort-related distractions, promote learner well-being (Figure 9), provide a sense of control within their learning environment and improve their comfort.

Figure 9: Ergonomic chair for learning in the classroom.

Source: Google search engine.

The installation of modular, stackable, retractable, interactive collaborative tables, with rotating chairs, are very practical during teaching and during evaluations. This furniture is quickly arranged into the desired shapes. This furniture is ergonomic and frees up space in the room, making it easy to carry out multiple activities: group work, individual work or pair work. From collaborative tables, to electric desks, through lockers and teaching materials such as tablets, laptops, software, etc.), to multimedia furniture and configurable desks for the teacher, pedagogy is revisited. This is the innovative classroom. The impact of the learning environment on student behavior and academic performance (Fischer, 2011) is obvious. Each element of the furniture changes the way they experience and experience their learning. They can thus observe the limits of individual work compared to collaborative work.

It is important to emphasize that these modular spaces have multiple advantages, some of which we can list here:

- ✓ he aesthetic appeal of learning spaces which, well designed, are attractive in a welcoming, inspiring, stimulating, reassuring and motivating atmosphere. This improves the mood of learners and leads them to actively participate in Lectures (CM), Directed Group Work (TD) whose island form engages students to cooperate among peers, to engage in work, to take a position, to give your opinion, to make decisions, to be responsible, to be autonomous, to take quotes, to have self-confidence, etc.;
- ✓ The comfort and well-being offered by ergonomic seats and tables. This furniture undoubtedly improves the physical and psychological well-being of learners. The learners are pleasantly comfortable in this setting and their

concentration is maintained over long hours. Which pleasantly increases their motivation and commitment to study well;

✓ Flexibility and the possibility of choice offered to the learner who no longer remains static for hours on fixed furniture. The flexible layout of the learning space then makes it possible to empower learners who, with complete confidence and ease, are mobile in the classroom space, fulfilled, serene. They thus better understand what the teacher gives them in terms of knowledge, interpersonal skills, know-how and know-how. Also, offering learners the latitude to choose their seat or learning style gives them the feeling of having control over their environment. Which highlights their autonomy, therefore, stimulates their motivation and commitment;

✓ Collaboration spaces (island, double U, etc.) facilitate group work and collaboration between peers and with the teacher. This will quickly develop in them, the feeling of belonging to a community, to a group or even to a family;

✓ Multisensory learning with the use of technological resources which enrich learning methods and styles. The five senses come into play here and the possibility of movement makes the learner more involved in their learning, especially since today, the positive contribution of ICT to learning no longer needs to be demonstrated (Karsenti).

A. The University of Ngaoundéré and the creation of an ergonomic classroom: for a collaborative learning space and promotion of local industry?

Furniture today has a major role in the use of teaching-learning paradigms as well as those relating to evaluation. It is therefore urgent that the executive of the University of Ngaoundéré adopts a policy to adapt the needs of learners and teachers to the furniture in the classrooms. Indeed, ergonomic classrooms are classrooms with mobile furniture, adapted to learning needs and innovative teaching methods with ICT tools. These ergonomic classes Their main goal is to change the passive or even classic learning environment of learners, with an active, dynamic, motivating learning environment which arouses commitment on the part of the latter and joyful participation in each course. The socialization of learners is thus facilitated given that they are constantly mobile, they collaborate with each other, they interact and have a feeling of belonging to the group.

It should be noted that the majority of teachers at the University of Ngaoundéré have not experienced these ergonomic classrooms in their careers, which the Quality Standards value today. The change therefore not only affects learners, but also teachers who must retrain in the school of transformative pedagogy whose soft-kills must be their leitmotif. This flexibility is framed by international standards which require the installation of innovative school furniture which is flexible, even intelligent. This, for a continuous improvement of the comfort of students in the classroom and their solar efficiency rates. To achieve this, the University of Ngaoundéré will have to readjust its requirements around the manufacturing of table-benches from local carpenters (Figure 10). In addition to the traditional manufacturing of wooden table-benches, the latter will improve their manufacturing by joining forces with their colleagues who are involved in the manufacturing of recycled iron for the manufacturing of casters that these carpenters will use to put on the bottom of chairs and desks. tables (Interview with Mr. Aboubakar, Carpentry Expert, December 8, 2023 at his workshop in the Bali district of Ngaoundéré).

Figure 10: Manufacturing of wooden table-benches by an Expert.

Source: Archive of Dr. Aïcha Mohamadou, 2023.

IV- Discussion and conclusion

It emerges from our article entitled: "Transformative pedagogy at the University of Ngaoundéré: from the layout of classrooms in buses to collaborative ones, in islands, in U-shaped or in flexible buses?", that ergonomics in the Classroom layout is a requirement of today's quality approach. The University of Ngaoundéré must not be on the fringes of this international movement. It must adopt an infrastructural policy based at the same time on organizational ergonomics (effective and efficient organization of classroom spaces for teaching, learning and quality assessment), physical ergonomics (improvement of student comfort in the furnished classroom space), etc.

The creation of flexible, mobile furniture adapted to all students will undeniably allow the University of Ngaoundéré to reconfigure learning spaces according to different types of teaching methods and activities. Collaboration between students will therefore be optimized and their academic performance will be enhanced. It is urgent for this university institution to align itself with the international movement which specifies the rules for the construction of university infrastructures. We are talking about transformative pedagogy which requires the creation of an active, dynamic, mobile learning space. It must replace the old passive furniture like that in Figure 10, which highlights the classic concept of manufacturing these static table-benches in connection with transmissive pedagogy.

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