Universal Design Practice Conference 2018:

Universal Playground

PUDCAD - Practicing Universal Design Principles in Design Education through a CAD-based game

OWL University of Applied Sciences and Arts
Detmold School for Architecture and Interior Architecture
Research Department perceptionLab

Concept: Ulrich Nether, Johanna Julia Dorf, Jan Phillip Ley
Text & Layout: Johanna Julia Dorf, Kristina Herrmann, Jan Phillip Ley
Editing: Ronja Bley, Susann Kreplin, Kristina Herrmann
Pictures: Kristina Herrmann, Ignacio Herce

ISBN: 978-3-939349-33-4
DOI: 10.25644/xzbb-8862

Erasmus+

TÜRKİYE ULUSAL AJANSI
TURKISH NATIONAL AGENCY

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"This project is granted by the European Commission for the Erasmus+ Program KA203 Programme conducted by the Center for European Union Education and Youth Programs (Turkish National Agency, http://www.ua.gov.tr) of the Turkish Republic Ministry of European Union. However, the Turkish National Agency or the European Commission cannot be held responsible for the opinions contained herein."

PUD CAD

KA2032017-1-TR01-KA203-046577
PUDCAD - Paracticing Universal Design Principles in Design Education through a CAD-Based Game

İTÜ · BAU Bahçeşehir University · LAB University of Applied Sciences · TH OWL Technische Hochschule Ostwestfalen-Lippe University of Applied Sciences and Arts · Università degli Studi Firenze · Politecnico Milano 1863 Dipartimento di Design · Ergoterapi Derneği · SERÇEV Serebral Palsili Çocuklar Derneği


UNIVERSAL
PLAY
GROUND


Time Table
15th - 19th of October 2018


Time Table

Universal Playground
Workshop Manual
The Conference
The Workshop
The Principles
Parameter of Universal Design for Spaces of Learning
The Tool Wall
PUDCAD Project
Universal Design Practice Conference 2018
International Workshop Week
UNIVERSAL PLAY GROUND
What does architecture contribute to social coexistence? How can we design spaces everyone can embrace, regardless physiological and psychological abilities?
We invite you to discuss and develop new strategies of thinking and making that can create places of common learning for everyone. By the use of Universal Design principles, those places will not only facilitate inclusion but also promote diversity! Share your ideas in the multicultural and interdisciplinary workshop "Universal Playground"
For more information visit: www.perceptionlab.de
LAMK


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INSIDE


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EduRoam

page 6-17 | Impressions of the Workshop "Universal Playground"

On Universal Design, Inclusion and Education

As the world becomes more and more diverse, we believe that spatial design can become a catalyst for social participation that respects heterogeneity.

How can a project like PUDCAD help in finding new strategies on implementing Universal Design and Inclusive Thinking in design education with the aim to give future designers the tools to take responsibility for a common future that triggers empathy for the other?

On Universal Design, Inclusion and Education

Introduction

"the design of spaces always affects social interactions."

We are convinced that interior architecture plays a significant role in social interactions in everyday life. Working on the topic of Universal Design, we experienced a limited understanding of the reach of Universal Design ideas in our field of expertise. Designers and design educators often underestimate their relevance due to the equation with accessibility. This can lead to a focus group that is limited to people with permanent disabilities, which affect motoric functions. Can we expand this scope to include every user by introducing a user spectrum clustered in "permanent, temporary and situational disabilities"[1] to use the full potential of inclusive thinking?

Encouraging the motivation in future designers to become caretakers of Inclusion in design and design research, tools like "The Principles of Universal Design"[2] can serve as an objective baseline for a universal approach in design education. Nevertheless, they might not be sufficient in terms of empathy and openness towards a broader user spectrum. We need new strategies that serve as catalysts for a process of rethinking and even more so establishing the idea of Inclusion.

For the specific context of learning environments, we developed the Parameters of Inclusive Design for Spaces of Learning (Parameter) to empower design students to create socially sustainable design concepts that include everyone. This documentation will show the process of ideating, testing and re-evaluating the Parameters as a new method for the design of inclusive school architecture as well as integrating inclusive thinking in design education in general. Therefore, the perceptionLab, a research focus

[1] Microsoft Inclusive Toolkit (available at: https://www.microsoft.com/design/inclusive)

[2] The Principles of Universal Design; The Centre for Universal Design (NC State University, 1997) (available at: https://projects.ncsu.edu/design/cud/about_ud/udprinciplestext.htm)

page 8-9
7 | Group finding session

as a representative for the University of Applied Sciences Ostwestfalen-Lippe, developed and realised the international student workshop "Universal Playground" as part of the Universal Design Practice Conference 2018, taking place at the Detmold School for Architecture and Interior Architecture, Germany. The conference is part of the ERASMUS+ project called 'PUDCAD - Practicing Universal Design Principles in Design Education through a CAD-based game' and represents the second step of the PUDCAD project after a first workshop meeting in Milan, Italy.

The PUDCAD Project

The PUDCAD project is related to one of the foremost priorities of the European Commission: to provide accessibility and inclusion of people with disabilities into everyday life.

Regarding the European Universal Design Standards and the current state of the universal design education in international networks, the goal of PUDCAD is a design game on a CAD-based platform which aims at students' learning and practicing their universal design knowledge and skills through an empathetic approach. It intends to provide an innovative way to learn and practice universal design principles for undergraduate students. The project deals with undergraduate design education to trigger the awareness of accessibility and enable future designers and architects to develop inclusive and innovative design ideas.

"PUDCAD aims to provide accessibility and inclusion of people with disabilities into everyday life."

PUDCAD involves a design game on a CAD-based platform, which will allow students to learn about basic and advanced universal design principles and train them with an entertaining and motivating format. The game will focus especially on inclusive high school design for students with cerebral palsy that includes several distinct forms of impairment of motor functions which cause different movement disorders.

The coordinator of the project is the ITÜ (Istanbul Technical Univer-

sity; Turkey). The partners are LAMK (Lahti University of Applied Sciences; Finland), UNIFI (Università degli Studi di Firenze; Italy), POLIMI (Politecnico Milano; Italy), TH OWL (Detmold School of Architecture and Interior Architecture; Germany), BUG Lab (Bahcesehir University Game Lab, Turkey), the „Association for Well-being of Children with Cerebral Palsy" (Turkey), as well as the „Occupational Therapy Association of Turkey".

PUDCAD is structured by a series of international conferences providing space for student workshops, expert talks and interdisciplinary and intercultural exchange for people with disabilities, students, professors and other experts. The project is financed by ERASMUS PLUS, started in September of 2017 and runs until 2020.

perceptionLab

The perceptionLab is a research focus of the Detmold School for Architecture and Interior Architecture as part of the University of Applied Sciences Ostwestfalen-Lippe. It has brought together lecturers from the Departments of Architecture, Interior Design and Media Production intending to make the perception of objects, space, and the media environment by users or people in general, central to research and teaching based on Human-centered design. Through the participation of various fields of study from the areas of design, planning and visualisation, and the additional integration of external experts from the areas of sociology, psychology and scenography, complex issues are examined from a holistic perspective. This cooperative effort serves to develop scientific and empirically ascertained knowledge about perception, in connection with experience from planning practice, to an application-oriented tool-kit for planning and design in the academic and practical realms.

"the perceptionLab focuses on the user's perception of objects, spaces, and media environments as a central research question. it, therefore, functions as an interdisciplinary research organ that connects empirical research, planning and teaching."

Working in the PUDCAD project, the perceptionLab aims to find innovative approaches towards the question on the role of spatial perception in the context of Universal Design and Inclusion. The goal is to develop participatory strategies for the design of spaces for social coexistence that include everyone.

Communication is always the base for inclusive processes. The physical and emotional reaction to our communication partner is based on how we perceive him. Within this context processes of spatial cognition are always dependent on previous experiences, personal intention, individual abilities and needs as well as geographical and cultural differences of the users. The way we perceive our surroundings, including the environment as well as other people, defines our interaction on a physical, psychological and social level. Talking about inclusion, we need multisensory environments that strengthen empathy for others. Those spaces can teach us to recognize originalities, understand special needs, evaluate ones very own position as well as its context to come to a suitable modus of interaction, that supports a culture of communication that is emotion-based but efficient. Inclusive Thinking can result in spaces for creative exchange and social coexistence.

"the way we perceive our surrounding defines our interaction on a physical, psychological and social level."

Additionally, the perceptionLab researches on digital technologies that can become part of a holistic toolset for inclusive teaching and learning environments. The project goal of a digital learning platform in the format of a CAD-based digital application opens up new fields of practical empirical social and spatial research to develop socially sustainable and innovative concepts of inclusion that are based on processes of spatial perception.

"in the context of learning environments, digital technology can become a tool for inclusion."

Universal Design Practice Conference 2018

The Universal Design Practice Conference 2018 created the space for exchange on new ways of inclusion in the context of school architecture using a variety of methods: an international four days workshop, several input formats and an interdisciplinary symposium.

The conference became a platform for a heterogeneous group of students, teachers, social institutions, people with different kinds of abilities and other experts to find possible approaches towards a design language for school architecture that includes everyone.

Universal Design Practice Conference
International Workshop Week

Time Table

Universal Playground

	Sunday 14|10	Monday 15|10	Tuesday 16|10	Wedn
09:00 h		Arrival | Check In	Creative Morning Session I "Sensory Drawing"	Fe "Play
10:00 h		Welcoming "Presents" & Overview Input Session I: PUDCAD + WS Milan "Universal Campus Tour" Empathy Parcour Team Building Action	Feedback & Task II "Sensory Research"	
11:00 h			Free Work	
12:00 h				
13:00 h		Break | Lunch	Break | Lunch	B
14:00 h		Input Session II: Student presentation EM MSI Universal Design Parameter for Universal Design Workshop Introduction Task I "Embodied Thinking"	Network Session I "School Architecture of the Region" Expert Input & Feedback	Ne Universa Exper
15:00 h	Arrival / Check In			
16:00 h				
17:00 h			Free Work	
18:00 h				
19:00 h			Short Day Review	
20:00 h		Universal Dinner Action together with LKS Detmold	"Free Time is Work Time"	Unive "Uni Unit
21:00 h				
22:00 h				

15th - 19th of October 2018

nesday 17|10	Thursday 18|10	Friday 19|10	Saturday 20|10
edback & Task III rything Experience"	Creative Morning Session II "Digital Crowding" Task IV "Virtual Playground"	PerceptionLab Symposium "Man, Space and Inclusion": Lectures Universal Playground Exhibition Student Projects Detmold School Scientific Poster Presentation Professional Feedback Conclusion & Perspectives	Check Out/ Departure
Free Work	Free Work		
reak | Lunch	Break | Lunch		
twork Session II "Aspects of al Design & Inclusion" t Input & Feedback	Task V "Universal Playground Exhibition"		
Free Work	Free Work		
Short Day Review	Short Day Review		
rsal Dinner Ation II iversal Lan Party" y3D Crash Course + "Juice"	"Free Time is Work Time"	Universal Celebration Action	

Universal Design Practice Conference 2018

The Conference

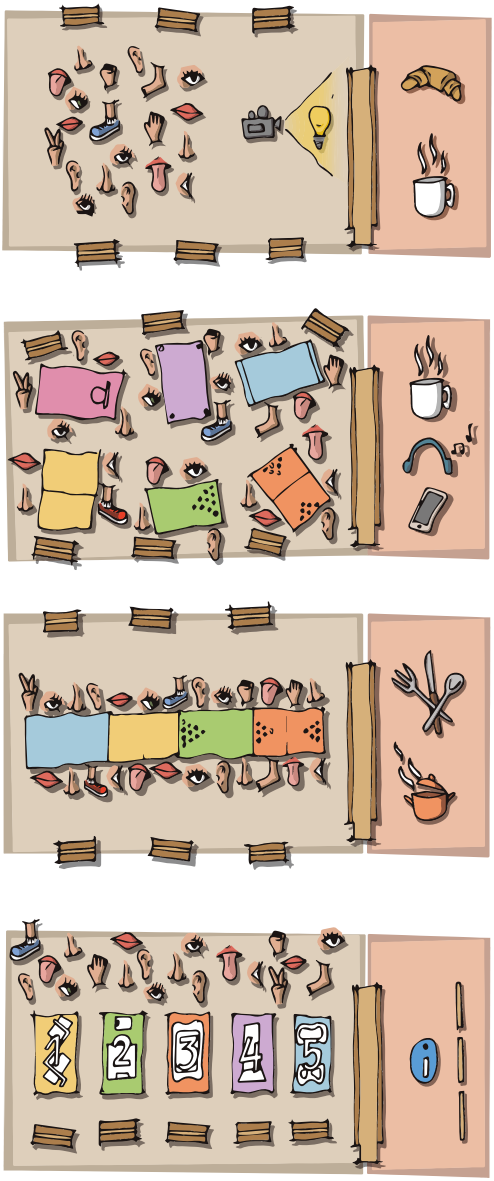
As a succeeding step to previous results from the first workshop in Milan (Italy), which was organised by POLIMI, the corresponding 'Universal Design Practice Conference 2018' was dealing with new strategies of thinking and prototyping, that can create places of common learning for everyone. Following the baseline ideas of Universal Design, those places not only facilitate inclusion but also promote diversity.

The conference area was located in the centre of the campus of the Detmold School for Architecture and Interior Architecture. Modular furniture and a transparent design concept created an inspiring workspace that provided the possibility to gather knowledge and experience on the topic of Universal Design and Inclusion, to get in contact with people with different abilities and learn new tools to create innovative ideas and Inclusive Design solutions for spaces of shared knowledge. The room convinced with a transformative potential that multiplies the individual abilities of its user. The conference consisted of three parts:

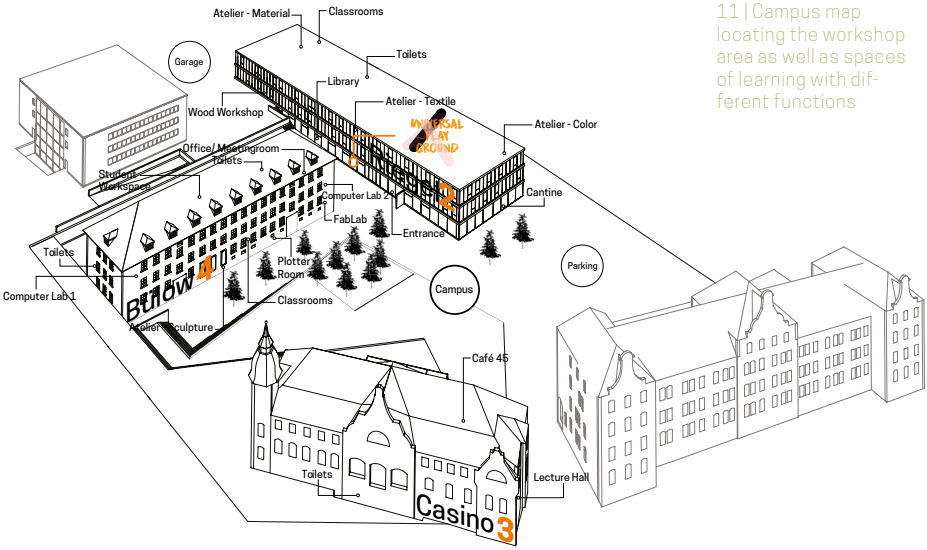
"spaces of inclusion can create spaces with a high transformative potential in general."

1. The Workshop

The international student workshop 'Universal Playground' aimed to discuss new approaches towards Universal Design by the exploration of the Parameter of Inclusive Design for Spaces of Learning. For that reason, we set a design research task at the learning space that is our university campus. To test and re-evaluate the Parameter the students had to work through a particular design research process and apply one given Parameter, in a specific spatial scenario. By the use of a transformative design concept, we gave the possibility to gather knowledge and experience on the topic of Universal Design, create an inspiring workspace to get in contact with people with different abilities and learn different tools to create universal design solutions



10 | Graphic of the transformative potential of the workshop space in four variations: presentation, group work, dinner, exhibition



11 | Campus map locating the workshop area as well as spaces of learning with different functions

2. The Input Sessions

in the context of European school environments.

Complementing the workshop, several „Input Sessions" provided inspiring information on the topic of Universal Design. After Prof. Ulrich Nether (speaker of the perceptionLab) welcomed the international guests to the campus, Johanna Julia Dorf and Jan Phillip Ley (moderator) introduced the structure of the conference. The participants were updated on previous steps of the PUDCAD project (Giorgio Buratti, POLIMI, Milan), following a general introduction of PUDCAD by Elif Oksuz as a member of the project leading team from ITÜ. After that, the Principles of Universal Design were introduced by the example of two modern public buildings from Finland (Timo Sulkamo, LAMK, Lahti). Students of the elective module "Man, Space and Inclusion" (2018, supervised by Nether and Ley) shared their discoveries on the topic of inclusive design. In a final lecture, new approaches towards Universal Design and Inclusion were presented by introducing the Parameters of Inclusive Design for Spaces of Learning (Jan Phillip Ley, TH OWL, Detmold), which were later to be tested in the upcoming workshop.

Empathy Parcour

After this first input block, the participants gained a first practical experience by an empathy parcour on the campus. Different kinds of supportive tools for people with disabilities were to be tested on the campus to create some kind of empathy and an understanding for the steps that have to be taken to make spaces accessible for everyone.
To mark the areas wherever the Universal Design approach is disregarded, participants awarded especially bad designs with the 'Award for the worst Universal Design' by putting a sticker on the specific object or location.

12 | Johanna Julia Dorf and Jan Phillip Ley welcoming the conference guests

13 | Antonia Reden giving an inspirational talk on qualities in living with disabilities

14 | Elif Oksuz presenting PUDCAD

15 | Conference participants in a lecture at one of many Input sessions

16 | Students testing different supportive devices for people with disabilities during the "Empathy Parcours" on the campus

17 | Students in team-building session trying to build diversified groups

18 | Participant awarding the "Award for the worst Universal Design" during the Empathy Parcour

19 | Students are testing the measurements in the local library


WSWZ 377
WSWZ 523
WSWZ 298
WSWZ 376
Psychologie
Bibliothek

20 | Moderator Prof. Ulrich Nether introducing Theresa Kellner and Katharina Bieker, supervisor and participant of the participatory design project "Geschwister-Scholl-Schule"

Network Sessions

In two „Network Sessions" we invited experts from different fields of design and education to give an insight on their professional and personal experiences.
Manfred Lux started the first Network Session on the topic of "School Architecture of the Region" by introducing the project "Schools for the world". Theresa Kellner and Katharina Bieker shared their experiences from the participatory project "Geschwister-Scholl-Schule". Stephanie Kleine, who is working at the "Lebenshilfe Detmold", gave insights to their activities working together with disabled people.
The second Network Session took place under the title "Aspects of Universal Design and Inclusion". Antonia Reden displayed her very personal involvement with her project called "Inklusion Inclusive". The heads of the "Heimatwerker" project Ricarda Jacobi and Katrin Kollodzey shared their experience in working in a project together with refugees. Thomas Bade gave an inspiring talk on possible strategies on dealing with the inclusion of people with disabilities into everyday life by using the method of Universal Design.

Constantin von der Mülbe opened the discussion on the possible usage of digital technologies by introducing his project called "Virtueller Meetingraum", a virtual meeting room for two people.

Universal Dinner

Various evening events gave the necessary inspiration to create innovative universal design ideas. Therefore the workshop area was transformed into a big kitchen and dining room to prepare and share regional specialities supervised by employees and trainees from the LKS Detmold, which is a service company that follows the philosophy of inclusion.

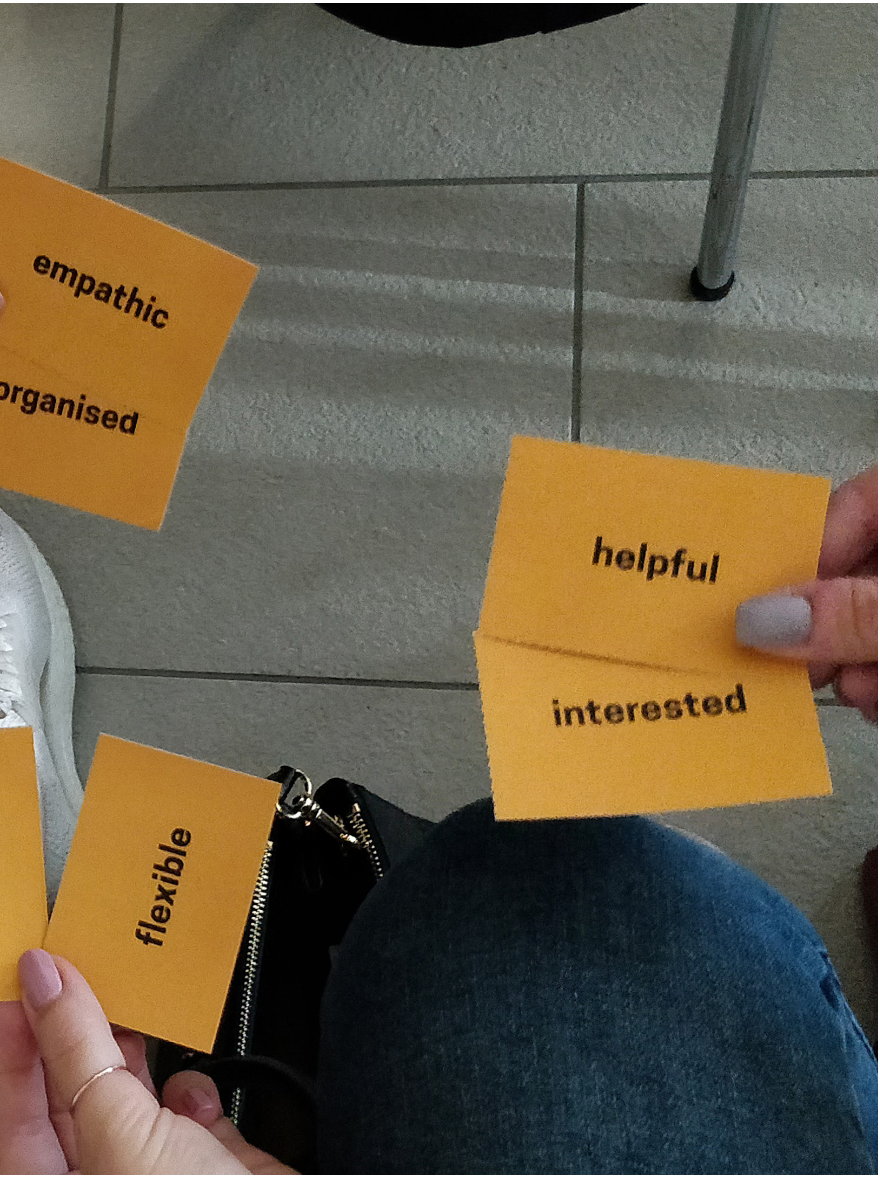
3. The Symposium

The results of the workshop were presented in the format of an exhibition. The „Universal Playground Exhibition" was part of the 11th PerceptionLab Symposium „Man, Space and Inclusion". The Symposium is a multidisciplinary platform for the exchange on the topic of inclusion based on international guest lecturers from different fields of expertise. Through different media, students had the chance to present their work, get feedback from experts to trigger discussions for the future process.

21 | Thomas Bade, head of the Universal Design Institute Munich, presenting his approach towards Universal Design

22 | Prof. Manfred Lux showing pictures of his project "Schools for the World"

23 | Character cards that help students to define their expertise and find complementary partners


empathic
organised
helpful
interested
flexible

24 | Chef Arnaud Brun from the local service LKS explaining the evening menu


LKS

25 | Students and LKS employees cooperatively preparing the first course

26 | A student team creatively presenting their team slogan by expressing it with individual gestures

Parameter of Inclusive Design for Spaces of Learning

To give design students a tool to develop a professional position towards Universal Design and Inclusion, we generated seven 'Parameters of Inclusive Design for Spaces of Learning', which were tested and re-evaluated in the international student workshop 'Universal Playground': 1. Well-being, 2. Organisation, 3. Communication, 4. Transformation, 5. Creativity and Collectiveness, 6. Action, 7. Diversity.

These Parameters are to be seen as a possible guideline for a first step in the direction of an inclusive school architecture that respects diversity and supports individual growth for the benefit of the collective.

Parameter of Inclusive Design for Spaces of Learning

Preface

1. Understand diversity as a tool to design spaces for social participation! Physiological attributes, individual abilities that lead to individual needs, but also preferences and personal experiences add up to the way we perceive the environment that surrounds us. To create the architectural base for social coexistence that respects the individual, we have to design spaces that trigger empathy!

2. We are all handicapped![1] Excluding design of spaces, objects or media environments can not only become a barrier for people with permanent limited abilities like for people in a wheelchair. It can also reduce the qualities of interaction (physical and social) temporary e.g. if you have a broken arm, or situational if you want to pass a door with a cup of your favorite tea. Universal Design should include all kinds of circumstances!

[1] Viktor J. Papanek »We Are All Handicapped«, detail of the Big Character Poster No. 1: Work Chart for Designers, 1973, © University for applied Arts Vienna, Victor J. Papanek Foundation

3. Create Access! Therefore we have to understand accessibility not only as a spatial but a social parameter. In learning environments it's not only important to design spaces that can physiological be accessible but to create architectural atmospheres that motivate for appropriation to result in spaces of identification. Universal Design has to create access to health, access to mobility, access to knowledge and access to social interaction.

Parameter 1: Well-being

In the context of school environments wellbeing is not only a question of health, personal care, nutrition and hygienic standards, acoustics as well as the provision of natural light, but also a social question! On this account we need spaces that are accessible for everyone. Starting from safety, we can learn that the way we design spaces or objects and its interactions affect the process of developing an individual personality.

page 48-49
27 | Students exchange ideas via a sketchbook

Additionally, well-being is created by a healthy balance between spaces for meeting and those to recover. A constant feeling of not belonging is an excluding factor that highly affects the psychological and physiological mechanism of the human body. Considering this we have to provide spatial strategies that stop discrimination and exclusion by designing accessible spaces of identification. Therefore a shared network of spaces should always consist of connected parts that are located around a recognizable center that serves as a landmark for orientation and identification (spatial and social). Spatial and visual connections inside and outside the structure create transparency that is needed to enable physical and mental well-being of everyone.

we can learn that the way we design spaces or objects and its interactions affect the process of developing an individual personality.

Keywords: personal care, individual health, nutrition, balance (activity and recovery), healthy architecture + healthy environment (access to natural light, acoustics, inside/outside, …), multisensory, social interaction, ergonomics: safety (Sicherheit), endurability (Erträglichkeit), reasonableness (Körperliche Zumutbarkeit), satisfaction (Zufridenheit), personality (Förderung der Persönlichkeit).

Parameter 2: Organisation

To navigate through a room, known or unknown, we must be able to sense its affordance. A clear structure with spatial differentiations and zonings by the use of a generous and simple design language are necessary to secure high functionality for heterogeneous user groups. Additional information systems should follow the idea of a two-sense-principle to grant a multisensory experience readable by everyone. A smart distribution of learning activities in spaces with multiple use can result in an accessible infrastructure that guarantees high flexibility and mobility in its core. The interior and furniture should follow the same principles.

A spatial network with clear connections between inside and outside and in between its micro layers creates an open architecture that serves as a base for the large spectrum of needs and requirements for a variety of learning formats. Transparency in the architectural language creates transparency in communication that supports equal learning in simultaneous and connected teaching activities. The organization of spaces always affects social interactions!

"the organization of spaces always affects social interactions!"

Keywords: functionality, order, structure (spatial differentiation, spatial distribution, connection to the surroundings), information, infrastructure, navigation/orientation, mobility, flexibility, accessibility, administration, right of co-determination (Mitbestimmungsrecht).

Parameter 3: Communication

Just as there are different kinds of people, there are different ways to communicate. We communicate by using language, written words, signs, gestures, facial expressions and many more to make the other understand our objectives. Since communication is the base for social interaction we have to find a way to make spaces speak! Designing multisensory experiences which different people with different abilities can adapt to, will help to create the architectural foundation for sharing knowledge and experiences, regardless social or cultural background and cognitive or physiological abilities. This architecture must tolerate differences in its usage by providing different layers of information to be sensed by the user. The human body must always be the media for communication. And those ways of communication are diverse!

"designing multisensory experiences which different people with different abilities can adapt to, will help to create the architectural foundation for sharing knowledge and experiences, regardless of social or cultural background and cognitive or physiological abilities."

Learning environments must offer a variety of different spaces for communication regarding the variety of its user groups. We need

spatial structures that make the people speak!

Keywords: language, body, social interaction, multisensory, sharing knowledge and experience, information, teamwork, communication culture, tolerance, affordance, proximity, spaces of communication (that are easy to "read" and support interaction).

Parameter 4: Transformation

Our goal is to create spaces of transformation that empower people to act self-sufficient and self-confident to develop individual interests and a feeling of responsibility for their environment (space) as well as for others (people). Learning environments should offer a variety of spatial constellations that help different users to gather knowledge by sharing experiences with respect to their specific skills and abilities. The use of digital tools and technology can help identifying, developing and communicating knowledge that not at last supports the individual by reacting and interacting (add and extend) with different physical and cognitive abilities. Universal Design should create accessibility not only in the sense of access to spaces but access to knowledge, health, mobility and social interaction!

"the concept of inclusion should shift into the idea of common learning that transforms the individual experience into collective knowledge! "

A variety of small spatial units with flexible use, connectable furniture and room extensions can create a high transformative potential. The concept of inclusion should shift into the idea of common learning that transforms individual experience into collective knowledge! Universal Design can make this process tangible.

Keywords: knowledge, individual skills, "learn from each other", shared experience, common learning, tools (technology), variety of (learning-) formats, cognitive abilities (individual support), multisensory, accessibility (open data, open space).

Parameter 5: Creativity + Collectiveness

Creativity is important to develop a striving, inquisitive and mindful personality. Therefore, the process of learning should not only be a process of thinking but equally a process of making. We want to create open architecture that respects and supports individual abilities.
Flexibility and improvisation should be a part of that as long as the architecture and objects of interaction give enough space for appropriation. Only the feeling of belonging can create collectivity and this multiplies creativity!

"only the feeling of belonging can create collectivity and this multiplies creativity!"

Creative spaces of learning create multisensory environments with diverse atmospheres by the use of colors, haptic materials, natural light and a high quality of affordance. They have the potential to teach improvisation und spontaneity to make the user learn how to overcome physical and mental barriers.

"creative spaces of learning have the potential to teach improvisation and spontaneity to make the user learn how to overcome physical and mental barriers!"

Cooperation means teamwork on all levels. Collectivity means transparent communication on concepts of the use of shared spaces, democratic decision making on common activities and their localization, multiple uses, time structures, rules and rituals considering every individual from students to parents, teaching staff to architects and politicians on local and regional level. Architecture should support those processes by the creation of high flexibility without losing the qualities of appropriation at the same time. Flexibility must not result in the loss of identity! The formation of identity must not result in the creation of boundaries. Existing boundaries have to be turned into fluid membranes that are inviting and supportive at the same time.

Keywords: thinking by making, creative thinking, multisensory, adaptation, appropriation, open architecture, improvisation, cooperation, teamwork, communication, shared spaces, decision making, flexibility, identity.

Parameter 6: Action

The design of dynamic architecture helps to increase the users' mobility. On the one hand we guarantee accessibility by a strategically smart organization of spatial relations, the creation of movement zones and circulation areas with appropriate dimensions that are based on diverse variations of the human scale. On the other hand we use design components that support active, dynamic and flexible use. Thinking in motion creates progress!

Keywords: thinking in motion, movement, mobility, activity, agility, flexibility, dynamic architecture, movement zone/ circulation area (Bewegungszonen/ Verkehrsflächen).

Parameter 7: Diversity

Inclusion can only be achieved by understanding diversity! School architecture only becomes a place of equal learning if it enables heterogeneity by respecting individual abilities, needs, desires and fears. Culture and personal experience shape us in the same way the design and use of spaces affect what one could call identity. Spaces of learning should not only teach knowledge but self-respect and the respect of the other - "the different one" - in the same way. In that sense Universal Design can become the place for individuation.

"inclusion can only be achieved by understanding diversity as a tool to design spaces for social participation!"

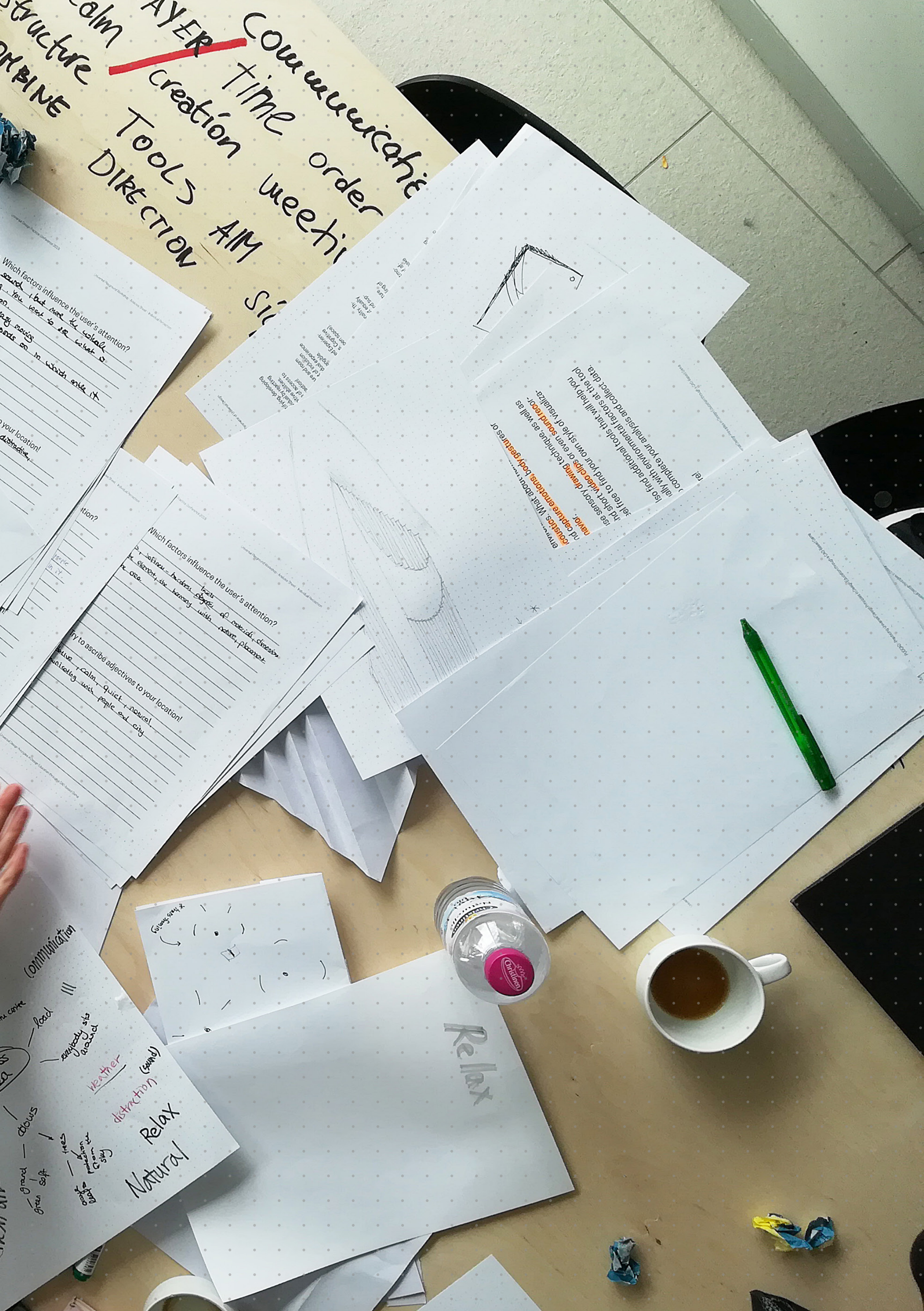
Keywords: individuality, individuation (Selbstwerdung), self-respect, individual needs/ abilities/ desires/ fears, heterogeneity, diversity in user and architecture, culture and identity, personality, lifelong learning.

Workshop: Universal Playground

The international student workshop aimed to test and re-evaluate the Parameter of Inclusive Design for Spaces of Learning by applying its' essential points to the spatial context of the campus. We developed a workshop design with a perception-based focus, which drew a classical design process in five steps: brainstorming, analysing, prototyping, digitalizing and communicating.

Innovative tools and a creative environment helped the students to catalyze empathic relations between people with different abilities and generate exciting results that will be presented in this chapter.


STABILO BOSS
Inside
Outside
- open space
- fresh air
- more inspiring
- in the middle of everything
- easy to find
- enough of space
- by using tree (nature)



calm
structure
communicate
time
order
creation
Tools
meeting
DIRECTION
AIM
Which factors influence the user's attention?
Try to ascribe adjectives to your location!
communication
weather
distraction
Relax
Natural
Relax

Workshop: Universal Playground Transforming spaces for Inclusion

The Workshop

The international student workshop 'Universal Playground' had the objective to develop criterias, strategies and practices for the design of learning environments, accessible for everyone, by following the principles of Universal Design. The Parameter we developed served as a starting point engaging the participating students, which formed international teams from all five involved universities. It consisted of five parts: to think, to analyse, to prototype, to digitalise, and to communicate and discuss with and about people with diverse abilities. Additionally, we provided the possibility to gather knowledge and experience on the topic of Universal Design and Inclusion, create an inspiring workspace, by the use of modular furniture, to get in contact with people with different abilities and learn new tools to create innovative ideas and Inclusive Design solutions for spaces of shared knowledge.
A Game Map guided the students through the different steps of the workshop to help situating the different Parameter, evaluating perception-based analysis of specific locations on the campus, building tangible prototypes that reflect on different users needs, working with innovative digital tools to expand the user's sensation as well as to get an understanding for the potential of digital gamification tools and show the results in the multisensory exhibition.

Each of the five workshop days had a driving motive which leads through the design research process:

Embodied Thinking

Like in any design process the participants started the project by thinking. Since thinking is easier if the body is part of it, we created a variety of board games that helped the students to brainstorm ideas. From the Parameter, they picked one topic and started their creative journey. They assembled the game that fits to their

page 58-59
28 | Students workplace in progress

topic and followed the instructions described on the Game Map. They played the games until they were out of ideas, reflect on the outcome and selected five terms that they found the most interesting. Each of the steps was documented on the provided field on the Game Map.

Sensory Research

„Dry analysis“ can be fun if the senses are involved! That’s why we collected a bunch of analog and digital tools that helped to analyse and understand the research subject. Based on the Parameter the students tried to find one location on the campus that interested them the most and suited to the topic. We asked to get a deeper understanding of the procedures by looking through the eyes of different characters. Therefore, they had to imagine and discribe three personas by using the info on the Game Map as well as the Analysis Sheets and the selection of additional digital tools! This data was used later in step four. We asked the students to take time to look, observe, write, sketch, record, ask, discuss and negotiate

29 | Students discussing about the Parameter Transformation by the use of the “Brainpong” game

The Workshop Manual was developed to give a brought overview on the program of the conference week including the conference itself, an introduction to the workshop including the different work tasks, giving background information on the topic of Universal Design, explaining the main concept of the PUDCAD project, as well as presenting the 'Parameter of Inclusive Design for Spaces of Learning'.

Universal Playground
Workshop Manual

The Conference

Within the Universal Design Practice Conference 2018 we want to discuss and develop new strategies of thinking and making that can create places of common learning for everyone. By the use of Universal Design Principles, those places not only facilitate inclusion but also promote diversity!

The conference consists of three parts:

1. First and most important is the international student workshop „Universal Playground“. Here we want to give you the possibility to gather knowledge and experience on the topic of Universal Design, create an inspiring workspace to get in contact with people with different abilities and learn different tools to create universal design solutions in the context of european school environments. The content adds to the previous results of the first workshop happened in Milan, Italy run by Politectioco di Milano (POLIMI).

2. We created different events around the workshop. Several „Input Sessions“ will provide you interesting information on the topic of Universal Design. In two „Network Sessions“ we invited experts from different fields of design and eductation to give an insight on their professional und personal experiences. Various evening events will give you the neccessary inspiration to create innovative universal design ideas.

3. The results of the workshop will be presented in the format of an exhibition. The „Universal Playground Exhibition“ will be part of the 11th PerceptionLab Symposium „Man, Space and Inclusion“. The Symposium is a multidisciplinary platform for the exchange on the topic of inclusion based on international guest lectures from different fields of expertise. Through different media, you will have the chance to present your work, get feedback from experts to trigger discussions for the following process.

The Workshop

The international student workshop „Universal Playground“ has the objective to develop criterias, strategies and practices for the design of learning environments, accessible for everyone, by following the principles of Universal Design.

The workshop is seperated in five parts: We want you to think, analyse, prototype, digitalise and communicate about, for and with people with diverse abilities.

We developed a list of Parameter for Universal Design[1] that will serve you as a starting point. Our Game Map will guide you through the different steps of the workshop to help you situate the different Parameter, evaluate perception-based analysis of specific locations on the campus, build tangible prototypes that reflect on different users needs, work with innovative digital tools to expand the user's sensation as well as to get an understanding for the potential of digital gamification tools and show your resluts in the multisensory „Universal Playground Exhibition“.

[1]: Sources: Principles of Universal Design (Center for Universal Design), PUDCAD Workshop results Milan, Ergonomics, Elective module „Man, space and inclusion“ (SoSe 2018; HS OWL), Research study „Raum und Inklusion - Neue Konzepte im Schulbau“, Microsoft Inclusive Design Toolkit.

The Principles

The 7 Priciples of Universal Design were developed in 1997 by an interdisciplinary design team with the purpose to guide the design of environments, products and communications to become accessible and useful for everyone:

1. Equitable Use
2. Flexibility in Use
3. Simple and Intuitive Use
4. Perceptible Information
5. Tolerance for Error
6. Low Physical Effort
7. Size and space for Approach and Use

1. Embodied Thinking

Like in any design process you will start your project by thinking!

Since thinking is easier if your body is part of it, we created a variaty of boardgames that help you to brainstrom ideas. From the Paramater for Universal Design pick one Parameter and start your creative journey. Assemble the game that fits to your topic and follow the instructions described on the Game Map. Play the games until you're out of ideas. Reflect on your outcome and select five terms that you find the most interesting. Document your results on the Game Map in the provided field.

2. Sensory Research

„Dry analysis“ can be fun if your senses are involved!

Thats why we collected a bunch of analog and digital tools that help you to analyse and understand your research subject. Based on your Paramter try to find one location on the campus that interests you the most and suits to your topic. Get a deeper undertanding of the procedures by looking through the eyes of different characters. Therefore, imagine and discibe three personas by using the info on the Game Map. Use the Analysis Sheets and select additional digital tools! This data will be used in step four. Take your time to look, observe, write, scetch, record, ask, discuss and negotiate what's going on.

Be attentive and document all of your steps. Follow the instructions and capture your results on your Game Map.

3. Plaything Experience

Now it's time to give your research an actual shape!

Therefore you can use several kinds of materials in order to build a 1:1 prototype as a tangible reference of your Parameter. The prototypes have two objectives: first, they should have a specific use that is related to the location you analysed and the needs and abilities of your persona. Second, it should embody your brainstrom- and research activities as a spatialized metaphor of your Parameter that others can experience as a haptic object.

Use cardboard for the main construction and functional elements. Think of how the different parts should be connected. Maybe add parts that can be movable. Use colored tape to visualize references, make connections, show directions or motion. Add coloring, text or drawings by using the ink pencils. Don't decorate!

Within all your steps don't forget to consider the Principles of Universal Design that will make your object usable for everyone!

4. Virtual Playground

In the fourth step it's time to make your prototype speak!

Together with experts for digital media you will get a glimpse on new technologies that help you to digitalise your prototypes and enlarge your tangible objects by the virtual world.
We will discover the process of SLAMScanning - a technique that creates 3D pointclouds from physical objects - in order to document your designs for digital post-production. By using augmented reality technology you will get the chance to augment your prototypes by different data you generated in the research phase of the workshop.
You will learn how to create multisensory realtime environments by adding digital sounds, videos or animations to the analog world. In the end, this will not only help to create an engaging exhibition but also creates access to your results for people with different kinds of abilities.

5. Universal Playground Exhibition

This last step is all about communication!

Reflect the process you had within the last week together with the whole team and try to develop a usefull concept on presenting your results as an holisitc and atmospheric exhibition. The „Universal Playground Exhibition“ should convey the message of your prototypes and give the visitors access to your personal approach to follow your process.
For the design of the space you can utilize all the materials we used and produced during the workshop. The main elements will be your prototypes, the game map and the digital AR-extension. Your Game Board will serve as the architectural structure.

During the Symposium each team will individually give a short five minutes presentation on their designs in front of the whole audience in order to show the youngest developments of the PUDCAD project, but also to receive individual feedback by guests and experts.

Parameter of Inclusive Design for Spaces of Learning

A: Understand diversity as a tool to design spaces for social participation! Physiological attributes, individual abilities that lead to individual needs, but also preferences and personal experiences add up to the way we perceive the environment that surrounds us. In order to create the architectural base for social coexistence that respects the individual, we have to design spaces that trigger empathy!

B: We are all handicapped! Excluding design of spaces, objects or media environments can not only become barriers for people with permanent limited abilities like for people in a wheelchair. It can also reduce the qualities of interaction (physical and social) temporary e.g. if you have a broken arm, or situational if you want to pass a door with a cup of your favorite tea. Universal Design should include all kinds of circumstances!

C: Create Access! Therefore we have to understand accessibility not only as a spatial but a social parameter. In learning environments it's not only important to design spaces that can physiological be accessible but to create architectural atmospheres that motivate for appropriation to result in spaces of identification. Universal Design has to create access to health, access to mobility, access to knowledge and access to social interaction.

Parameter 1: Well-being
In the context of school environments well-being is not only a question of health, personal care, nutrition and hygienic standards, acoustics as well as the provision of natural light but also a social question! On this account we need spaces that are accessible and safe for everyone. Starting from safety, as the first step of the "Stage model for ergonomic burden" (reference "Stufenmodell der Belastungen"), we can learn that the way we design spaces or objects and its interactions affect the process of developing an individual personality.

Additionally, wellbeing is created by a healthy balance between spaces for meeting and those to recover. A constant feeling of not belonging is an excluding factor that highly affects the psychological and physiological mechanism of the human body. Considering this we have to provide spatial strategies that stop discrimination and exclusion by designing accessible spaces of identification. Therefore a shared network of spaces should always consist of connected parts that are located around a recognizable center that serves as a landmark for orientation and identification (spatial and social). Spatial and visual connections inside and outside the structure create transparency that is needed to enable physical and mental well-being of everyone.

Parameter 2: Organisation
In order to navigate through a room, known or unknown, we must be able to sense its affordance. Information systems should follow the idea of a two-sense-principle to grant a multisensory experience. A clear structure with spatial differentiations and zonings by the use of a generous and simple design language are necessary to secure high functionality for heterogeneous user groups. A smart distribution of activities for spaces with multiple use can result in an accessible infrastructure that guarantees high flexibility and mobility for everyone. The interior and furniture should follow the same principles. The organization of spaces always affects social interactions!

A spatial network with clear connections between inside and outside and in between its micro layers, creates an open architecture that serves as a base for the large spectrum of needs and requirements for a variety of learning formats. Transparency in the architectural language creates transparency in communication that supports equal learning in simultaneous and connected teaching activities.

Parameter 3: Communication
Just as there are different kinds of people, there are different ways to communicate. We communicate by using language, written words, signs, gestures, facial expressions and many more to make the other understand our objectives. Since communication is the base for social interaction we have to find a way to make spaces speak! Designing multisensory experiences where different people with different abilities can adapt to, will help to create the architectural foundation for sharing knowledge and experiences, regardless social or cultural background and cognitive or physiological abilities. This architecture must tolerate differences in its usage by providing different layers of information to be sensed by the user. The human body must always be the media for communication. And those are different!

Learning environments must offer a variety of different spaces for communication regarding the variety of its user groups. We need spatial structures that make the people speak!

Parameter 4: Transformation
Our goal is to create spaces of transformation that empower people to act self-sufficient and self-confident to develop individual interests and a feeling of responsibility for their environment (space) as well as for others (people). Learning environments should offer a variety of spatial constellations that help different users gathering knowledge by sharing experiences with respect to their specific skills and abilities. The use of digital tools and technology can help identifying, developing and communicating knowledge that not at last supports the individual by reacting and interacting (add and extend) with different physical and cognitive abilities.
Universal Design should create accessibility not only in the sense of access to spaces, but access to knowledge, health, mobility and social interaction!

A variety of small spatial units with flexible use, connectable furniture and room extensions can create a high transformative potential. The concept of inclusion should shift into the idea of common learning that transforms individual experience into collective knowledge! Universal Design can make this process tangible.

Parameter 5: Creativity + Collectiveness
Creativity is important to develop a striving, inquisitive and mindful personality. Therefore the process of learning should not only be a process of thinking but equally a process of making. We want to create open architecture that respects and supports individual abilities. Flexibility and improvisation should be a part of that as long as the architecture and objects of interaction give enough space for appropriation. Only the feeling of belonging can create collectivity and this multiplies creativity!

Creative spaces of learning create multisensory environments with diverse atmospheres by the use of colors, haptic materials, natural light and a high quality of affordance. They have the potential to teach improvisation und spontaneity to make the user learn how to overcome physical and mental barriers.

Cooperation means teamwork on all levels. Collectivity means transparent communication on concepts of the use of shared spaces, democratic decision making on common activities and their localization, multiple use, time structures, rules and rituals considering every individual from students to parents, teaching staff to architects and politicians on local and regional level. Architecture should support those processes by the creation of high flexibility without losing the qualities of appropriation at the same time. Flexibility must not result in the loss of identity! The formation of identity must not result in the creation of boundaries. Existing boundaries have to be turned into fluid membranes that are inviting and supportive at the same time.

Parameter 6: Action
The design of dynamic architecture helps to increase the users' mobility. On the one hand we guarantee accessibility by a strategically smart organization of spatial relations, the creation of movement zones and circulation areas with appropriate dimensions that are based on diverse variations of the human scale, on the other hand we use design components that support active, dynamic and flexible use. Thinking in motion creates progress!

Parameter 7: Diversity
Inclusion can only be achieved by understanding diversity! School architecture only becomes a place of equal learning if it enables heterogeneity by respecting individual abilities, needs, desires and fears. Culture and personal experience shape us in the same way the design and use of spaces affect what one could call identity. Spaces of learning should not only teach knowledge but self-respect and the respect of the other - "the different" - in the same way. In that sense Universal Design can become the place for individuation.

The Tool Wall

For the different tasks we provide different tools. You can find them located at the toolwall that builds the center for all conference activities. Depending on the purpose you can select from classical empirical research tools (analog and digital) for analysing different scenarios, a collection of information that can update you on the topic of Universal Design, empathy tools that will help you understanding your target groups needs and creative tools using different media (analog and digital) that help you designing spaces approaching the principles of universal design. Every tool can create results that claim to contribute to a holistic multisensory experience of the different universal aspects of spatial activities within the context of school architecture.

PUDCAD Project

The PUDCAD project is related to one of the foremost priorities of European Commission: to provide accessibility and inclusion of people with disabilities into everyday life.

Regarding the European Universal Design Standards, and the current state of the universal design education in international networks, the goal of PUDCAD is a design game on a CAD-based platform which aims at students' learning and practicing their universal design knowledge and skills through an empathetic approach. It intends to provide an innovative way to learn and practice universal design principles for undergraduate students.
The project deals with undergraduate design education to trigger the awareness of accessibility and let future designers and architects develop inclusive and innovative design ideas.

PUDCAD involves a design game on a CAD-based platform which will allow students to learn about basic and advanced universal design principles and train them with an entertaining and motivating format. The game will focus especially on inclusive high school design for students with cerebral palsy that includes several distinct forms of impairment of motor functions which cause different movement disorders.

The coordinator of the project is the ITÜ (Istanbul Technical University; Turkey). The partners are LAMK (Lahti University of Applied Sciences; Finland), UNIFI (Università degli Studi di Firenze; Italy), POLIMI (Politecnico Milano; Italy), the Detmold School of Architecture and Interior Architecture; Germany, the „Association for Well-being of Children with Cerebral Palsy“ (Turkey) as well as the „Occupational Therapy Association of Turkey“.

PUDCAD is structured by a series of international conferences, providing space for student workshops, expert talks and interdisciplinary and intercultural exchange for perople with disabilities, students, professors and other experts.
The project is financed by ERASMUS PLUS, started in September of 2017 and runs until 2020.

Hochschule Ostwestfalen-Lippe
University of Applied Sciences

The Manual was developed by the PerceptionLab - in person Ulrich Nether, Johanna Julia Dorf and Jan Phillip Ley - a research focus of the Detmold School for Architecture and Interior Architecture.

31 | Student-team brainstorming with a game board

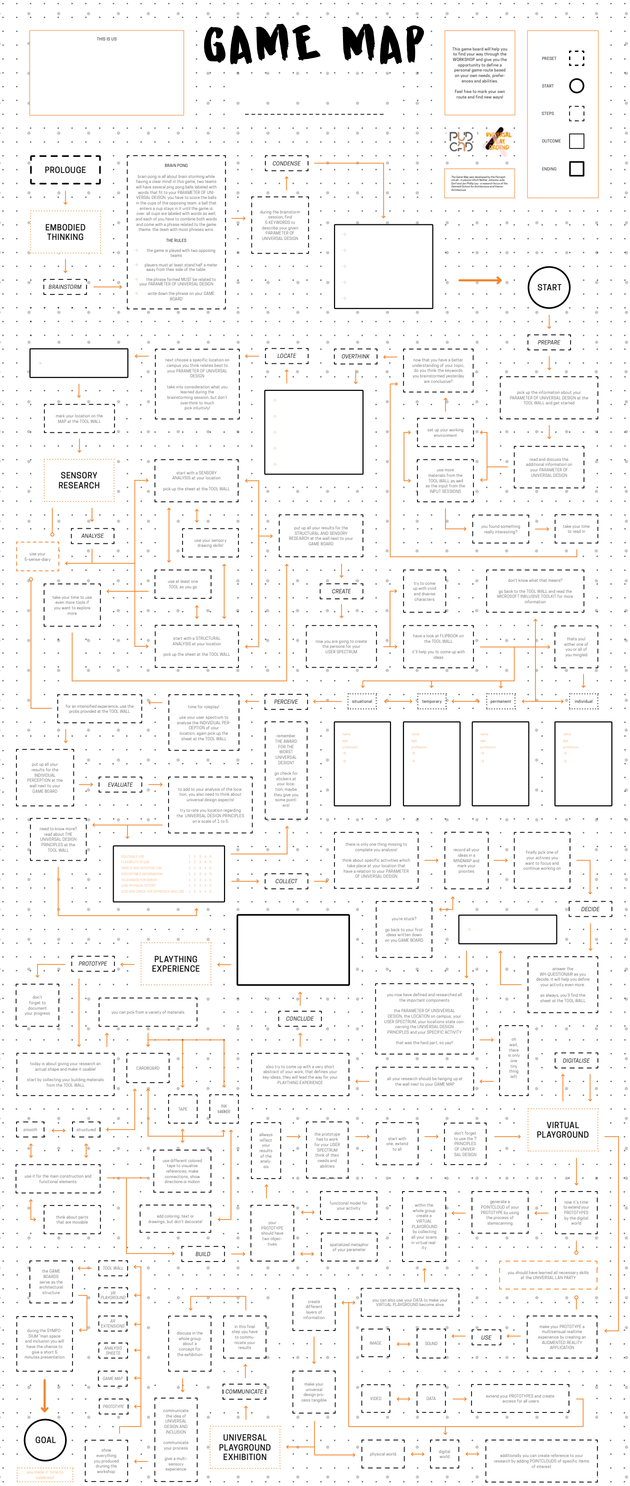

GAME MAP

32 - 35 | Impressions of the first step of the workshop. The students brainstormed keywords related to their Parameter and wrote them on different elements. In the game, they helped to find new connections within the specific topics

36 | Groups collecting and discussing sensory research results

37 | Digital technologies were used to generate and evaluate research data on qualities of spaces and usability

The Game Map was designed to give students a guiding thread throughout the design process. By the use of the map, the students had the chance to document the different considerations and to develop their personal opinion on the given parameter as well as to evaluate the specific location they were working with. The students used the map to discuss, reflect and present their proceeding towards an interdisciplinary audience.


GAME MAP
THIS IS US
This game board will help you to find your way through the WORKSHOP and give you the opportunity to define a personal game route based on your own needs, preferences and abilities.
Feel free to mark your own route and find new ways!
The Game Map was developed by the PerceptionLab - in person Ulrich Nether, Johanna Julia Dorf and Jan Phillip Ley - a research focus of the Detmold School for Architecture and Interior Architecture.
PRESET
START
STEPS
OUTCOME
ENDING
PROLOUGE
EMBODIED THINKING
BRAINSTORM
BRAIN PONG
brain pong is all about brain storming while having a clear mind! in this game, two teams will have several ping pong balls labeled with words that fit to your PARAMETER OF UNIVERSAL DEISGN. you have to score the balls in the cups of the opposing team. a ball that enters a cup stays in it until the game is over. all cups are labeled with words as well, and each of you have to combine both words and come with a phrase related to the game theme. the team with most phrases wins.
THE RULES
the game is played with two opposing teams
players must at least stand half a meter away from their side of the table.
the phrase formed MUST be related to your PARAMETER OF UNIVERSAL DESIGN
write down the phrase on your GAME BOARD
CONDENSE
during the brainstorm session, find 5 KEYWORDS to describe your given PARAMETER OF UNIVERSAL DESIGN
START
PREPARE
pick up the information about your PARAMETER OF UNIVERSAL DESIGN at the TOOL WALL and get started
read and discuss the additional information on your PARAMETER OF UNIVERSAL DESIGN
set up your working environment
use more materials from the TOOL WALL as well as the input from the INPUT SESSIONS
you found something really interesting?
take your time to read in
now that you have a better understanding of your topic, do you think the keywords you brainstormed yesterday are conclusive?
OVERTHINK
LOCATE
next choose a specific location on campus you think relates best to your PARAMETER OF UNIVERSAL DESIGN
take into consideration what you learned during the brainstorming session, but don't overthink to much pick intuitivly!
mark your location on the MAP at the TOOL WALL
SENSORY RESEARCH
ANALYSE
use your 5-sense-diary
start with a SENSORY ANALYSIS at your location
pick up the sheet at the TOOL WALL
use your sensory drawing skills!
use at least one TOOL as you go
take your time to use even more tools if you want to explore more
start with a STRUCTURAL ANALYSIS at your location
pick up the sheet at the TOOL WALL
put up all your results for the STRUCTURAL AND SENSORY RESEARCH at the wall next to your GAME BOARD
CREATE
now you are going to create the persona for your USER SPECTRUM
try to come up with vivid and diverse characters
have a look at FLIPBOOK on the TOOL WALL
it'll help you to come up with ideas
don't know what that means?
go back to the TOOL WALL and read the MICROSOFT INKLUSIVE TOOLKIT for more information
thats you! either one of you or all of you mingled
situational
temporary
permanent
individual
name
age
profession
PERCEIVE
time for roleplay!
use your user spectrum to analyse the INDIVIDUAL PERCEPTION of your location, again pick up the sheet at the TOOL WALL
for an intensified experience, use the probs provided at the TOOL WALL
remember THE AWARD FOR THE WORST UNIVERSAL DESIGN?
go check for stickers at your location, maybe they give you some pointers!
put up all your results for the INDIVIDUAL PERCEPTION at the wall next to your GAME BOARD
EVALUATE
to add to your analysis of the location, you also need to think about universal design aspects!
try to rate you location regarding the UNIVERSAL DESIGN PRINCIPLES on a scale of 1 to 5
need to know more? read about THE UNIVERSAL DESIGN PRINCIPLES at the TOOL WALL
EQUITABLE USE 1 2 3 4 5
FLEXIBILITY IN USE 1 2 3 4 5
SIMPLE AND INTUITIVE USE 1 2 3 4 5
PERCEPTIBLE INFORMATION 1 2 3 4 5
TOLERANCE FOR ERROR 1 2 3 4 5
LOW PHYSICAL EFFORT 1 2 3 4 5
SIZE AND SPACE FOR APPROACH AND USE 1 2 3 4 5
COLLECT
there is only one thing missing to complete you analysis!
think about specific activities which take place at your location that have a relation to your PARAMETER OF UNIVERSAL DESIGN
record all your ideas in a MINDMAP and mark your priorites
finally pick one of your activies you want to focus and continue working on
DECIDE
you're stuck?
go back to your first ideas written down on you GAME BOARD
answer the WH-QUESTIONAIR as you decide, it will help you define your activity even more.
as always, you'll find the sheet at the TOOL WALL
you now have defined and researched all the important components
the PARAMETER OF UNSIVERSAL DESIGN, the LOCATION on campus, your USER SPECTRUM, your locations state concerning the UNIVERSAL DESIGN PRINCIPLES and your SPECIFIC ACTIVITY
that was the hard part, so yay!!
oh wait, there is only one tiny thing left
all your research should be hanging up at the wall next to your GAME MAP
also try to come up with a very short abstract of your work, that defines your key-ideas, they will lead the way for your PLAYTHING EXPERIENCE
CONCLUDE
PLAYTHING EXPERIENCE
PROTOTYPE
don't forget to document your progress
you can pick from a variety of materials
today is about giving your research an actual shape and make it usable!
start by collecting your building materials from the TOOL WALL
CARDBOARD
TAPE
INK MARKER
smooth
structured
use it for the main construction and functional elements
use different colored tape to visualise references, make connections, show directions or motion
think about parts that are movable
add coloring, text or drawings, but don't decorate!
BUILD
your PROTOTYPE should have two objectives
functional model for your activity
spatialized metaphor of your parameter
allways reflect your results of the analysis
the prototype has to work for your USER SPECTRUM think of their needs and abilities
start with one, extend to all
don't forget to use the 7 PRINCIPLES OF UNIVERSAL DESIGN
VIRTUAL PLAYGROUND
DIGITALISE
now it's time to extend your PROTOTYPES by the digital world
generate a POINTCLOUD of your PROTOTYPE by using the process of slamscanning
within the whole group create a VIRTUAL PLAYGROUND by collecting all your scans in virtual reality
you should have learned all necessary skills at the UNIVERSAL LAN PARTY
make your PROTOTYPE a multisensual realtime experience by creating an AUGMENTED REALITY APPLICATION
USE
IMAGE
SOUND
VIDEO
DATA
you can also use your DATA to make your VIRTUAL PLAYGROUND become alive
create different layers of information
make your universal design process tangible
extend your PROTOTYPES and create access for all users
physical world
digital world
additionally you can create reference to your research by adding POINTCLOUDS of specific items of interest
UNIVERSAL PLAYGROUND EXHIBITION
COMMUNICATE
in this final step ypu have to communicate your results
discuss in the whole group about a concept for the exhibition
communicate the idea of UNIVERSAL DESIGN AND INCLUSION
communicate your process
give a multisensory experience
show everything you produced druning the workshop:
TOOL WALL
VR PLAYGROUND
AR EXTENSIONS
ANALYSIS SHEETS
GAME MAP
PROTOTYPE
the GAME BOARDS serve as the architectural structure
during the SYMPOSIUM "man space and inclusion you will have the chance to give a short 5 minutes presentation
GOAL
you made it. time to celebrate!

39 | Interim presentation of first research results with professional feedback from the supervisors

Plaything Experience

what's going on. Again, the results were to be captured on the Game Map.
In the next step, it was time to give the research an actual shape! Therefore the participants could use several kinds of materials in order to build a 1:1 prototype as a tangible reference of the Parameter. The prototypes had two objectives: first, they should have a specific use that is related to the location the teams analysed and the needs and abilities of the personas. Second, it should embody the brainstorm- and research activities as a spatialized metaphor of the Parameter that others were able to experience as a haptic object.

The students were able to use cardboard for the main construction and functional elements. It was important to think of how the different parts should be connected. It was possible to use coloured tape to visualize references, make connections, show directions or

page 73
38 | Game Map

motions. The students added colouring, text or drawings by using ink pencils.
Within all these steps the teams were asked not to forget to consider the Principles of Universal Design that made the objects usable for everyone!

Virtual Playground

In the fourth step, it was time to make the prototype speak! Together with experts for digital media, the groups got a glimpse of new technologies that helped to digitalise the prototypes and enlarge the tangible objects by the virtual world. They discovered the process of SLAMScanning - a technique that creates 3D point clouds from physical objects - in order to document the designs for digital post-production. By using augmented reality technology the students got the chance to augment the prototypes by different data that was generated in the research phase of the workshop. They learned how to create multisensory realtime environments by adding digital sounds, videos or animations to the analog world. In the end, this not only helped to create an engaging exhibition but also create access to the results for people with different kinds of abilities.

Universal Playground Exhibition

The last step was all about communication! The students had to reflect the process they had within the last week together with the whole team with the goal to develop a useful concept on presenting the results as a holistic and atmospheric exhibition. The „Universal Playground Exhibition“ should convey the message of the prototypes and give the visitors access to the students' personal approach to be able to follow the process. For the design of the space, the students utilized all the materials they used and produced during the workshop.

During the Symposium each team individually gave a short five minutes presentation on their designs in front of the whole audience, in order to show the youngest developments of the PUD-CAD project, but also to receive individual feedback by guests and experts.

40 - 43 | Impressions of the first step of the workshop. The students brainstormed keywords related to their Parameter and wrote them on different elements. In the game, they helped to find new connections within the specific topics

44 | Thomas Bade and Antonia Reden are giving feedback on the students' progress

45 | A group discussing first digital sketches on their design


#2

46 | Test of a prototype of an AR-application to show hidden features of the cardboard object

47 | Presentation of SLAMscan technology to generate point clouds of 3D objects and environments for digital postproduction


GAME MAP

48 | Exhibition of the final prototypes


INSIDE
OUTSIDE
Transformer

49 | Students testing their interactive AR application

Workshop: The Results

During the workshop, the students always used the Parameter as a starting point to the design process. Working with only the given Parameter without further requirements and the general context of learning environments, the students searched for corresponding locations and included specific interactions and activities depending on their personas.

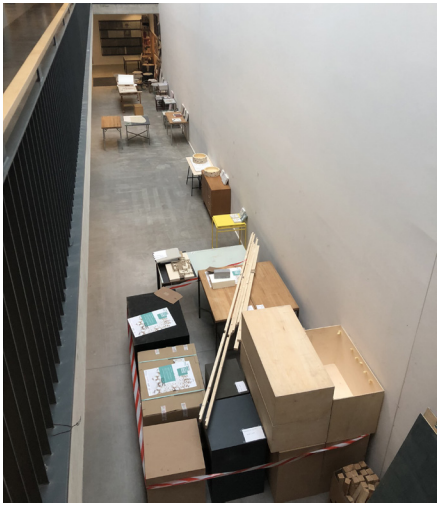
The following pages show the outcome of the six international student teams.

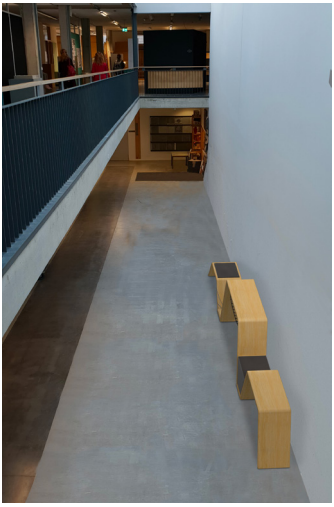
1. The students decided for a location in the university building that is characterised by a high ambiguity of its function although there seemed to be certain spatial qualities. The description of the **Parameter Organisation** helped the team to clear out their goals which they summarised by the terms: planning, structure, communication, accessibility and functionality.

This is how they came up with the idea of one big folding furniture that reassures the corridor by giving it a clear direction that reacts on the existing architecture. The Parameter Organisation helped the students to understand the

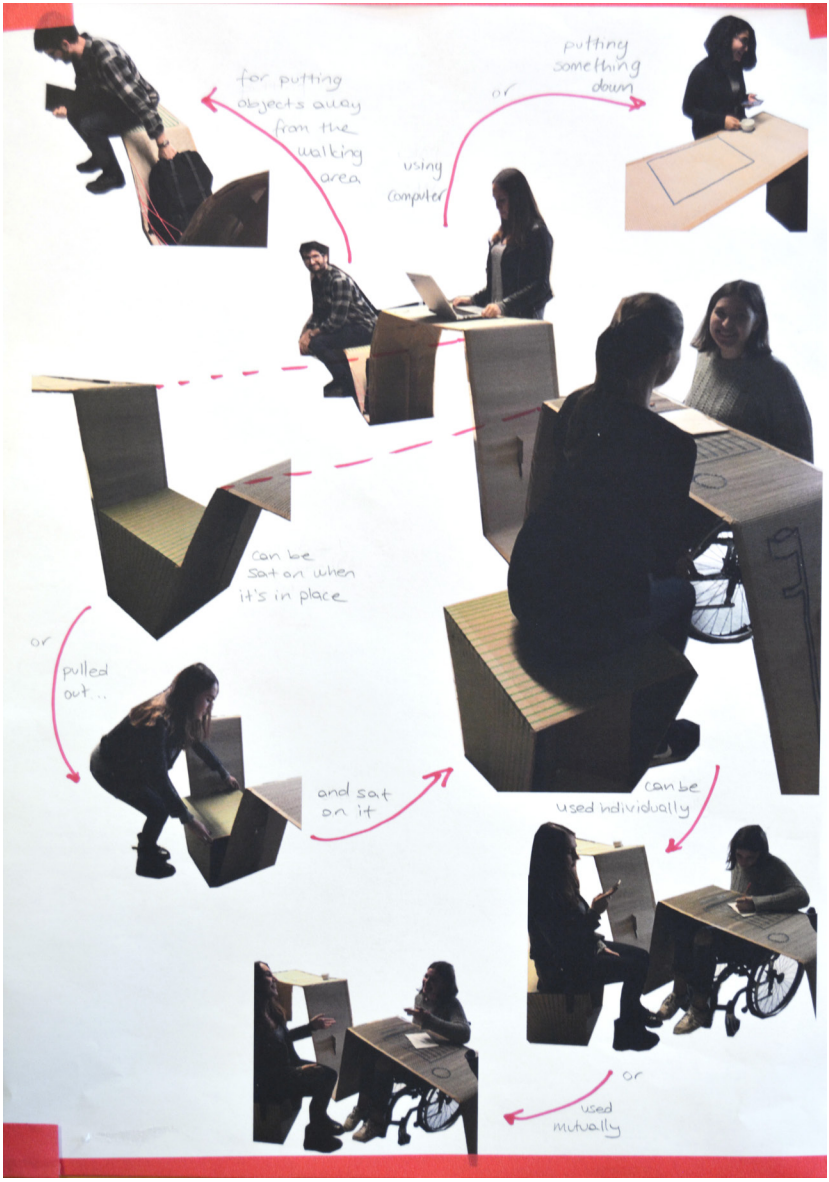
50 | Rendering showing three different functions: relaxing, exhibiting, working

51 - 52 | The new object gives structure to the corridor





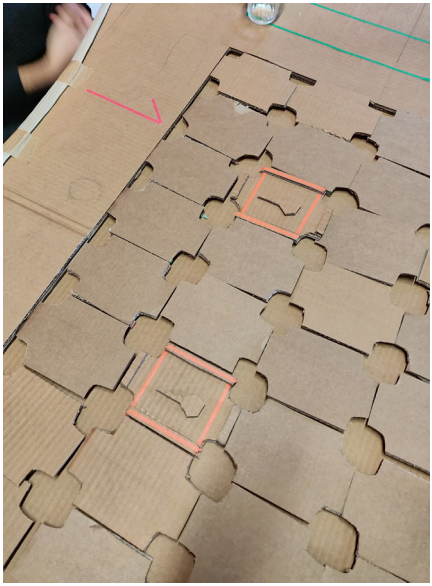
53 | Graphic of different use cases for a user with different abilities



importance of having a spatial focus that serves for orientation.

The new object connects the functions: relaxing, exhibiting and working. The clear design and a smart proportioning make it easy for the user, with or without disabilities, to understand the different offers of the object. The use of different haptics and materials underlines this effect. Flexible furniture that is integrated into the structure makes the different functions accessible by everyone. The high variability of the object can create communicative moments that are as diverse as its users.

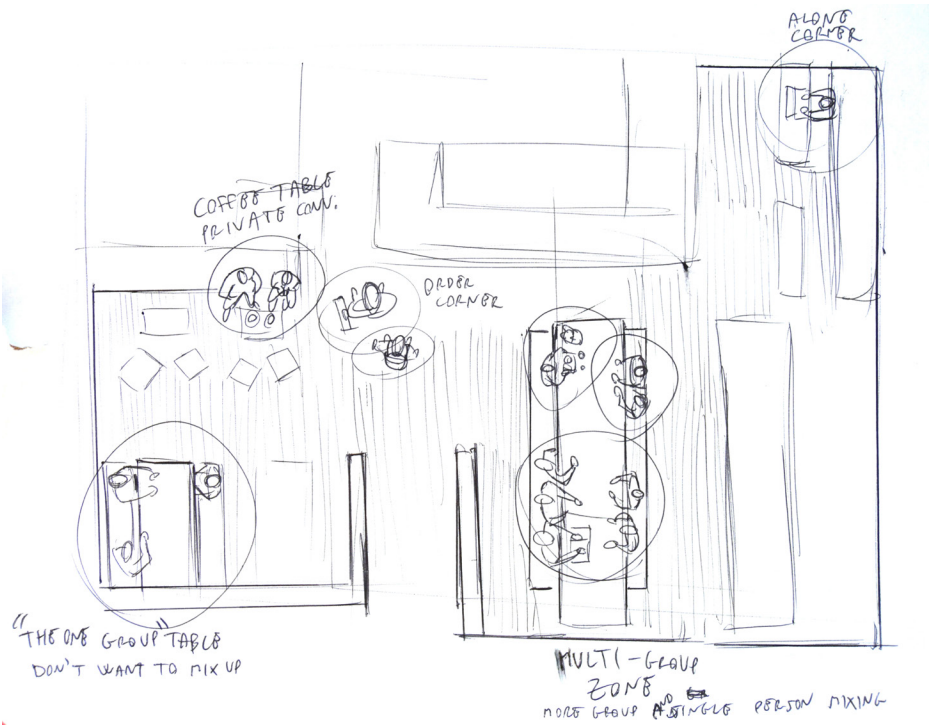
54 - 57 | The communication table in action



2. The team Communication designed a game that brings different people together at the same table to trigger a kind of communication, that usually stays absent. The **Parameter Communication** helped the students to develop five important attributes for their design: space, connecting activities, sharing, understanding, to adapt.

After the detailed analysis of the café area on the campus, the team discovered a lack of furniture that connects people instead of separating them. This is why they developed a kind of memory game that stimulates different senses and thereby creates high qualities of

58 | Analytic drawing of different forms of communication in the campus café



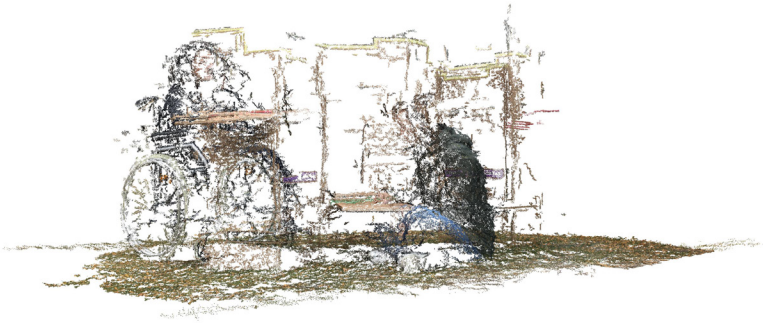
communication that serve as a base for sharing knowledge and experience.

Playing the game creates high valued memories due to its multisensory approach. The game becomes a trigger for conversations between people that usually stay quiet. The use of the Parameter Communication helped the students to find a universal design language and a playful way to empower vulnerable groups to get confident with their own opinion and turn into an active part of the community.

3. The **Parameter Transformation** helped the students to transfer the classical concept of their brainstormed activity ‘teaching’ to an innovative understanding of learning involving the groups’ design criteria: change our thinking, opportunity, accessibility, connectivity, tools. The object facilitates an innovative system for different formats of typical teaching and learning activities. The main goal of the object was to trigger a different way of thinking on the terms of teaching and learning. By inventing a foldable system that serves as wall elements, displays or seating they created an inclusive environment with high transformative potential.

59- 60 | The prototypes transform the original idea of the classroom into an open concept for sharing knowledge

61 - 62 | Visualisation of two-point clouds as a digital representation of the physical object



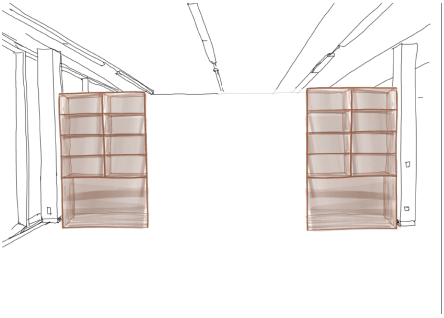
Space becomes a tool to provoke a change in thinking that generates diverse types of communication. This supports the formation of a personal approach towards learning assignments and gives space to strengthen individual skills, interests and social competences.

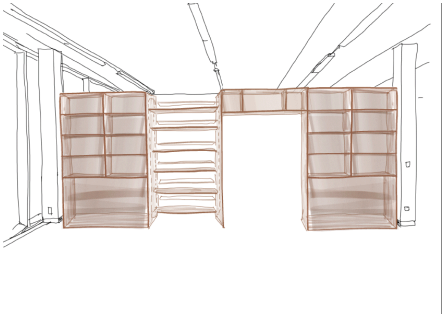
Special about their approach was the interest in discussing possible definitions of knowledge. They re-imagined standardised concepts of teaching by creating an architectural framework that supports individual needs to transform the idea of knowledge to the idea of shared experience.

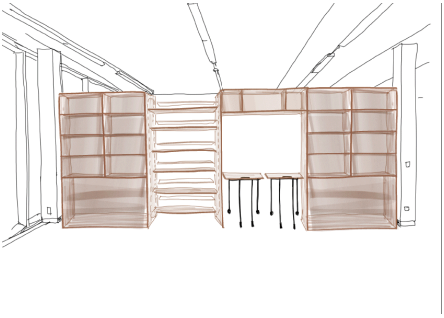
4. The fourth group edited a location in the main building that separates a café from a seminar area. They realised the importance of creativity and collectivity within any learning process; the information from the **Parameter Creativity & Collectiveness** gave them the tools to find a design implementation of this concept which was based on the terms: change of thinking, opportunity, accessibility, connection and tool.

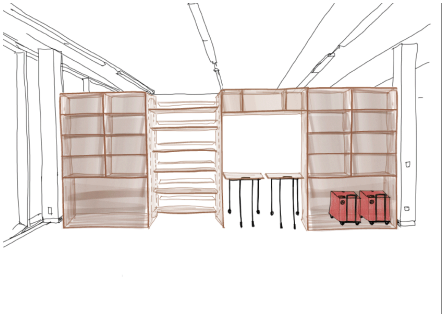
The perforated an existing closed shelf rack to recreate a visual connection between the two separate rooms. Additionally, they designed a table and seating furniture that can be integrated

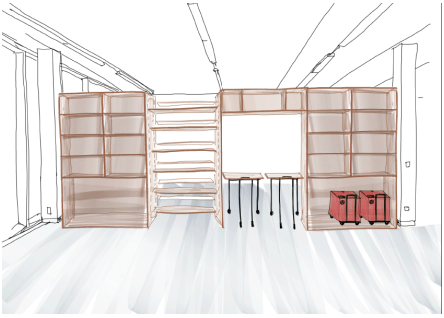
63- 68 | Storyboard of how the new design produces communication between two sides



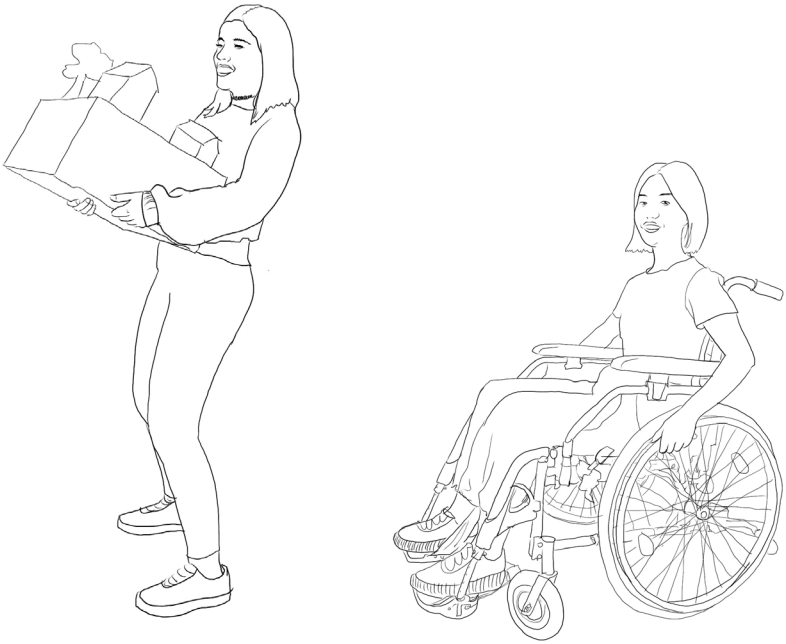








69 - 72 | Drawing of four personas with situational, permanent and temporary disabilities



73 - 74 | Storyboard on how to use the new objects

into gaps inside of the shelf. The more people use the furniture, the stronger the connection between the two rooms becomes.

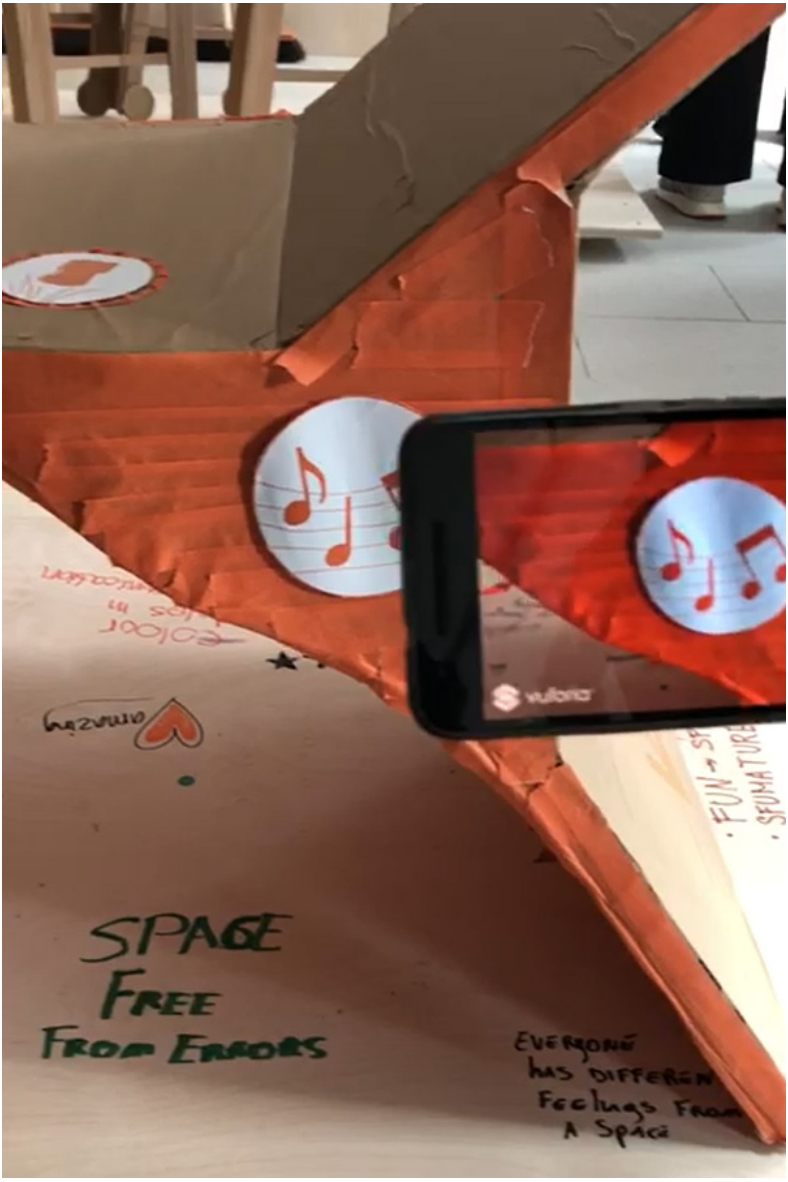
Both, the table and the chair are equipped with wheels that make it easy to handle even with one hand. The design of the furniture enables a creative way of using the space depending on the activity that takes place. Every student can have its chair, which can be used as a storage room for materials and personal items. This allows the user to identify with the object, which simultaneously strengthens the feeling of collectiveness.

5. Proceeding from the **Parameter Action** this group developed five design criteria through an elaborated examination of our description in connection to their brainstorming results. For them, the term action consisted of freedom, companionship, flexibility, fun and subtlety. These criteria lead the students to an outside space on our campus for which they developed the specific use 'culture-action'.

The object they designed was to allow being a meeting and orientation point and a space for spontaneous lectures. By extending the physical object with a digital layer that can be activated through an AR application, a public sound library for

75 - 80 | The students designed a multifunctional object that activates the qualities of the location

81 | Screenshot of the AR-application in action: if the camera tracks the icon, a sound gets triggered



teaching and an outdoor cinema and a place for music were implemented.

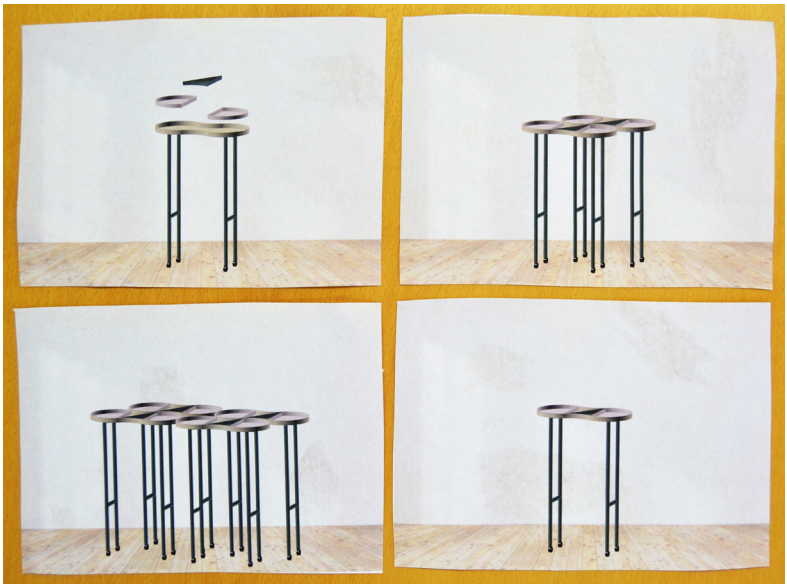
Interesting about this process was that the exploration of the Parameter extended with the analysis of the chosen location helped them to even add to it in their way. The term ‘action’ was enhanced with the social character of ‘culture’. This guided them to come up with a distinct design language in their build object that enables the users’ potential to create inclusive environments for multisensory experiences and social interaction.

6. Connectivity, heterogeneity, individual needs, balance and empathy serve as a base for the design of the sixth group.

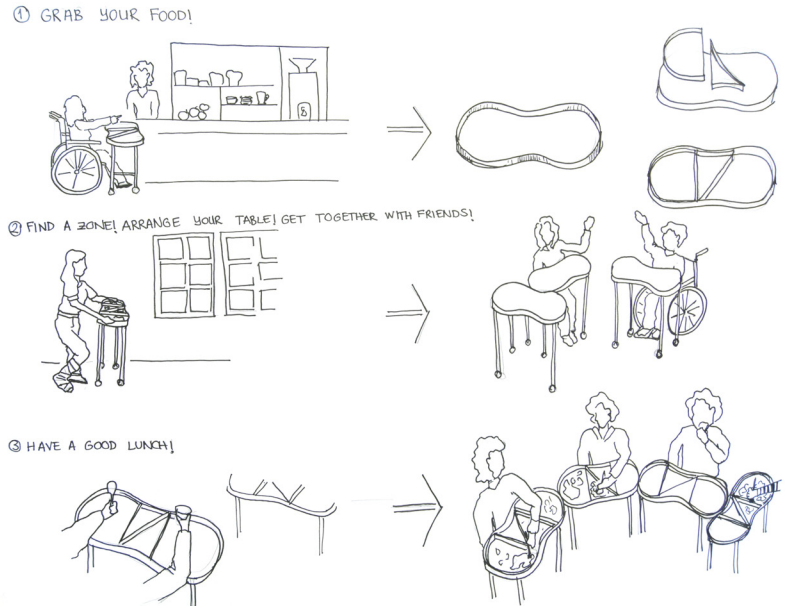
After the analysis of different locations on the campus, they decided that all their principles would merge into the activity of eating. Considering the Principles of Universal Design, they came up with the idea of a modular lunch tray that supports the ideas described in the **Parameter Diversity.**

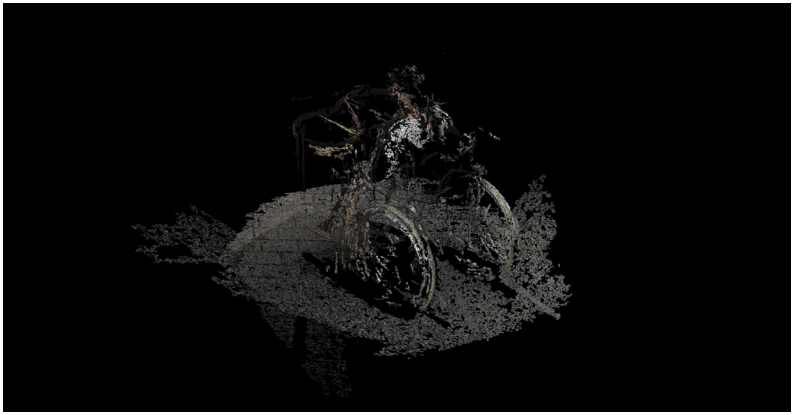
The heterogeneity of the different people coming together in a school building inspired the group to use an organic design language for the tray and to equip it

82 | The teams suggestion to support diversity: a modular lunch tray that reacts on different users needs and can be combined to an uniting dining table



83 | The lunch tray tested in three scenarios





84 | Generated point cloud shows the use of the lunch tray for wheelchair users

with a rollable carrier structure that respects different needs of the different users.

The Parameter supported the group to establish a principle for an item that activates the users' abilities to join each others' strenghts and weaknesses to one embracing organism, that is as diverse as its components. The lunch tray enables situations that make people realise the potential of diversity by looking for what is common, instead of defining it by what is different.

Symposium: Man, Space and Inclusion

The annual perceptionLab symposium is focussing on the extension of the interactions between humans and spaces by another additional area of interest.

Following the idea of the PUDCAD project, the conference week concluded with the 11th perceptionLab symposium "Man, Space and Inclusion". Seven international guests presented their experience working on the topic of inclusion. Presentations of internal activities and several contributions from the PUDCAD team complemented the program.

The results of the workshop became part of the event in form of the "Universal Playground Exhibition" that was developed by the international student teams.

11th perceptionLab Symposium "Man, Space and Inclusion"

"Everbody is handicapped. We want to design spaces that are accessible for everyone", stated Jan Phillip Ley, the moderator of the 11th symposium of the internal research focus PerceptionLab. The annual symposium this year ran under the title of "Man, Space and Inclusion" and for the first time with the participation of international speakers. It marked the final event of the previous conference week and included the presentation of the workshop results in the form of the "Universal Playground Exhibition".

"inclusion happens whenever people participate in the creation of space."

Inclusion is not only about stairs and wheelchairs, underlines Prof. Ulrich Nether, organiser and speaker of the PerceptionLab. Inclusion happens "whenever people participate in the creation of space." This is why the PerceptionLab demands to include all kinds of people in the design process, regardless of the cultural, geographical, social or economical background.

Thomas Tajo in his presentation promoted an architectural culture which is based on multisensory experiences that address all the senses, instead of an understanding of architecture that is limited to the visual world. The US American is a researcher in Belgium, blind himself and recommends to improve the built environment to train the non-visual brain, otherwise, those non-visual senses would atrophy. Tajo is actively involved at "Visioneers", a non-profit corporation in California that teaches visually impaired people to see, by the use of a special technique called "Echolocation". (www.visioneers.org)

"we need an architectural culture that creates multisensory experiences."

page 120-121
85 | the arrival of the conference participants

86 | Ulrich Nether welcoming the guests of the annual symposium

87 | Registration and get together before the lectures start

88 | Impressions of the presentation of internal activities referring to Universal Design and Inclusion that accompanied the lectures


Hochschule Ostwestfalen-Lippe
University of Applied Sciences

89 | Tomas Tajo explaining the basics of the echo-locatization technique


Pollock
1666

90 - 93 | Marlena Dorniak, Dr. Christian Timo Zenke (90), Isabelle Dechamps (91), Prof. Eva Filter (92) and Cornelius Voss (93) sharing their experiences on the topic of Universal Design and Inclusion in the context of learning environments

90

91

92

93


WOODIE HAMBURG
wooden
modular
reusable
student dormitory
WOODIE HAMBURG
wooden
modular
reusable
student dormitory

94 | Christine van Meegen and Sebastian Kubersky from Studio C.A.R.E. are performing their "Curated catastrophe"

95 | Fiammetta Costa introducing the PUDCAD case study to the audience

The example of the newly planned redesign for the Laborschule Bielefeld shows to what extent Universal Design can support teaching and learning. The originally open architectural concept of the experimental educational institution no longer seemed to be up to date. It gives privilege to strong students while at the same time the weaker ones can concentrate less in this troubled learning atmosphere. At the same time, there are 82 per cent who rate the open concept as positive. The redesign of the common area would aim to find solutions for the acoustical issues and give space for moments to rest. As educators and researcher, Marlena Dorniak and Dr. Christian Timo Zenke from the Bielefeld University supervise the project in cooperation with Prof. Eva Filter from the Detmold School for Architecture and Interior Architecture who in her lecture introduced in her lecture three student designs and three prototypes as the result of the semester project.

"Universal Design can support teaching and learning experiences."

Many times one has the feeling that the user is the enemy of architects and designers. Outstanding design is often very rigid and exclusive. "There is no space for individuality", articulate the designer Christine van Meegen and the artist Sebastian Kubersky (Rotterdam from Studio C.A.R.E. Their solution: "Curated catastrophe", which first of all create a "tabula rasa" situation. The deconstruction is followed by a reconstruction, whereby the self-design by the user (do-it-yourself) and a process-oriented design are in the foreground. (www.studio-c-a-r-e.com)

"there is no space for individuality."

The Berlin-based non-profit organisation "be able" is a creative collective for inclusion by design. Starting in 2010, the product designer Isabelle Dechamps developed the educational concept of "be able" together with a workshop for people with disabilities, that was awarded several times. Dechamps presented three projects during her talk. It is important to plan carefully, to en-

"it is important to plan carefully, to enable people to design themselve."

able people to do it themselves and then release their design. "Don't overdesign", so her recommendation. (www.be-able.info)
The project WOODIE located at the Hamburg district Wilhelmsburg shows an example for inclusive architecture. The single units of the accommodation house are specifically designed for students by Sauerbruch Hutton architects.
Inspired by the container stacks in the Port of Hamburg, the idea was born to prefabricate the timber units in container form and implement them in a modular design. The project was presented by the architect Cornelius Voss from the developer PRIMUS developments GmbH, which realized WOODIE together with Senectus GmbH. (www.woodie.hamburg.de)

The PUDCAD project was presented by Prof. Özge Cordan (Technical University of Istanbul). First results of the activities of the PUDCAD partners found their way into the series of lectures by the poster presentation of the international case-study on the status quo of Universal Design in secondary school buildings from the different partner countries. The base for the study was developed by the team from POLIMI (Milan, Italy) in form of a checklist that was used in each study to evaluate the architecture in terms of Universal Design and accessibility. Prof. Fiammetta Costa introduced the first results of the studies, followed by a short poster presentation by each of the partners.

Later on, the posters became part of the "Universal Playground Exhibition", that presented the outcomes of the conference week in one uniting format. The modular elements of the workshop were used by the six student teams to display their results. Additional wall elements were used to show materials from the research process, the AR applications were to be tested by the visitor and created the multi-sensual environment that was needed to be accessible by everyone. The event ended after a short recap, by the moderators Nether and Ley, in open discussions in a relaxing but inspiring atmosphere.

96 | Visitors of the "Universal Playground Exhibition" contemplating the 1:1 prototypes


GAME MAP

97 | Students presenting their results


KU LEUVEN

98 | Students and visitors discussing the research process


having lunch
DIVERSITY

99 | Visitors and participants testing the developed objects


E-Mail
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Serv

Scientific Poster

One part in the PUDCAD project is the scientific dissemination of knowledge. In form of a poster presentation each partner University developed a scientific poster of the international case-study on the status quo of Universal Design in secondary school buildings from the different partner countries.

The base for the study was developed by the team from POLIMI (Milan, Italy) in form of a checklist that was used in each study to evaluate the architecture in terms of Universal Design and accessibility.

On the following pages are the scientific posters of the participating universities, which were shown in the context of the exhibition universal playground.

Is It Really Accessibility? A Qualitative Study About School Accessibility

Authors

Gonca Bumin
Sinem Kars
Meral Huri
Hülya Kayihan

Faculty of Health Sciences, Department of Occupational Therapy, Hacettepe University, Ankara, Turkey

Introduction

- Participation in home school and community activities has a positive impact on children's health development and wellbeing

- Participation is influenced by personal factors related to the child and family and also by environmental factors

- International Classification of Functioning Disability and Health framework identify the environment as a key factor influencing participation

- Children with disabilities highlights the physical social attitudinal and institutional environments as key factors contributing to children's participation

Is It Really Accessibility?
A Qualitative Study About School Accessibility

Gonca BUMİN, Sinem KARS, Meral HURİ, Hülya KAYIHAN

Faculty of Health Sciences, Department of Occupational Therapy, Hacettepe University, Ankara, Turkey

Introduction

✓Participation in home, school, and community activities has a positive impact on children's health, development, and wellbeing.

✓Participation is influenced by personal factors related to the child and family and also by environmental factors.

✓International Classification of Functioning, Disability and Health framework identify the environment as a key factor influencing participation.

✓Children with disabilities highlights the physical, social, attitudinal and institutional environments as key factors contributing to children's participation.

Purpose

The purpose is to evaluate the situation of school within the contexts of being easy to access, safe, healthy, comfortable public places with the idea that the students with cerebral palsy can exist in school and use all fields equally.

Pictures from SERÇEV High School



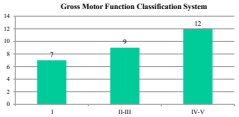




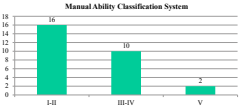

Material and Methods

The study was done in SERÇEV Occupational and Technical Anatolian High School for Children with Cerebral Palsy (CP). Twenty-eight student (f:12, m:16) with CP and the school environment which consist of 16 classrooms, 16 workshops, 5 laboratories, 1 library, 2 guard waiting rooms, 1 gymnasium, 1 conference hall and a dining hall were evaluated for accessibility by occupational therapists. The Gross Motor Function Classification System (GMFCS), Communication Function Classification System (CFCS), Manual Ability Classification System (MACS) and semi-structured interviews with the student and the family were used to assess school participation.

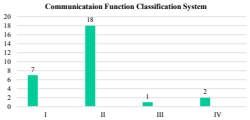
Results



Level I: Walks without limitations
Level II: Walks with limitations
Level III: Walks using a hand-held mobility device
Level IV: Self-mobility with limitations; may use powered mobility
Level V: Transported in a manual wheelchair



Level I: Handles objects easily and successfully
Level II: Handles most objects but with somewhat reduced quality and/or speed of achievement
Level III: Handles objects with difficulty; needs help to prepare and/or modify activities
Level IV: Handles a limited selection of easily managed objects in adapted situations
Level V: Does not handle objects and has severely limited ability to perform even simple actions



Level I: Sends and receives with familiar and unfamiliar partners effectively and efficiently
Level II: Sends and receives with familiar and unfamiliar partners but may need extra time
Level III: Sends and receives with familiar partners effectively, but not with unfamiliar partners
Level IV: Inconsistently sends and/ or receives even with familiar partners

Discussion

- ✓ Even students with CP have problems with using the elevators, toilets and access to recreational and sports areas in school; accessible designed schools enhance activity participation of students with disability.
- ✓ Environment is a mediator between the functional capacity and the independence of students with disability.
- ✓ Rehabilitation therapists such as occupational therapists can act for assessing environment, physical, cognitive, sensory capabilities of students with disability and can collaborate with architects to enhance occupational participation, functionality and independence of students with disability.

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Table 1: School Accessibility Problems	n
The elevator button is high and small to press	7
The elevator don't have a floor location indicator	7
The elevator is not user-friendly (door width and the elevator are small)	7
Clothes tree at classes are very high and they are useless	15
Toilet accessibility is a problem (heavy door, sink height, faucet, soap dispensers and hand dryers are useless)	20
Gymnasium, conference hall and dining hall are too far from the main building	19

Universal Design Criteria Awareness Through Experience In High Schools

Two case studies in Turkey

Authors

Doç. Dr. Özge Cordan
Dr. Demet Arslan Dinçay
Dr. Çagıl Yurdakul
Res. Ass. Elif Belkıs Öksüz
Büra Gizem Vayvay

Istanbul Technical University, Istanbul, Turkey

Introduction

In Turkey, the last countrywide statistical research on disability issues was made by TUIK (Turkish Statistical Institute) in 2010. It is the only study which shows the real numbers and the situation of the whole country while there have been several individual studies has been done by the researchers and institutes after.

According to the mentioned study, there is an inverse ratio between the age and education, hence children with disabilities are more likely to drop their education as they get older. The inadequate nature of the schools is the main reason for the students with disabilities for leaving education system early. Neither curriculum of the education system nor architectural and interior design of those schools cater for the principals of the universal design. Having said that, application of universal design to the design of the schools especially for the secondary and higher education is an urgent and important matter within Turkey.

UNIVERSAL DESIGN CRITERIA AWARENESS THROUGH EXPERIENCE IN HIGH SCHOOLS; TWO CASE STUDIES IN TURKEY

Doç. Dr. Özge Cordan, Dr. Demet Arslan Dinçay, Dr. Çağıl Yurdakul, Res. Ass. Elif Belkıs Öksüz, Büşra Gizem Vayvay

INTRODUCTION

Breaking down the barriers, understanding diversity and cultural differences and thinking beyond the possible define the 21st century. Embracing technology and broad usage of it have helped us to overcome many difficulties in the way. Yet, having physical difficulties in our daily lives creates a contradiction when we are surrounded with many possibilities. Scientists, academics and designers first pointed out the disability issues in 1960's but it was architect Ronald Mace who first used the term of 'universal design' and mention about building an environment to be aesthetic and usable to the greatest extent possible by everyone, regardless of their age, ability, or status in life. (Jellison, J., 2015)

Since then, many academic studies have been made to enhance the quality of life for each and every member of the society regardless of the age and physical abilities under the concept of Universal Design. The Universal design aims to design everything and set the system to meet the needs of all the people who would like to use it. It breaks down the barriers, includes everybody and stops every kind of exclusion. Thus, disseminating and adopting its criteria must be prioritized in all areas of society.

In Turkey, the last countrywide statistical research on disability issues was made by TUIK (Turkish Statistical Institute) in 2010. It is the only study which shows the real numbers and the situation of the whole country while there have been several individual studies has been done by the researchers and institutes after. According to the mentioned study, there is an inverse ratio between the age and education, hence children with disabilities are more likely to drop their education as they get older. The inadequate nature of the schools is the main reason for the students with disabilities for leaving education system early. Neither curriculum of the education system nor architectural and interior design of those schools cater for the principals of the universal design. Having said that, application of universal design to the design of the schools especially for the secondary and higher education is an urgent and important matter within Turkey.

From the study of TUIK (TurkStat, Survey on Problems and Expectations of Disabled People, 2010)

From the study of TUIK (TurkStat, Survey on Problems and Expectations of Disabled People, 2010)

OBJECTIVE

With the leadership of ITU (Istanbul Technical University) department of Interior Architecture and LIPPE (Hochschule Ostwestfalen) LAMK (Lahti University of Applied Sciences; Finland), UNIFI (Università degli Studi di Firenze; Italy), POLIMI (Politecnico di Milano; Italy), the "Association for Well-being of Children with Cerebral Palsy" (Turkey) as well as the "Occupational Therapy Association of Turkey", PUDCAD (Practicing Universal Design Principles in Design Education through a CAD-Based Game) has been carried out to inform, update and allow design students to adopt universal design criteria for schools while practicing it simply with a CAD based game. The game is planned to be designed as a U.D (Universal Design) teaching and training tool for Design Studios in the departments of Interior Architecture, Architecture or Product Design.

Although the 7 main principles developed by Mace such as equitable use; flexibility in use; simple and intuitive; perceptible information; tolerance for error; low physical effort; size and space approach and use are theoretically known by the students, they may fail to include these principles to their design. (Preiser,2007) Using games as a part of the education is not a new method in higher education as implementing game into the learning process motivates students to train, focus, reinforce the knowledge, problem solving, develop skills. (Annansingh, 2018) Therefore, the game or it is more accurate to use 'serious game' in this context that developed by PUDCAD team will create a practical interface for not only learning about these principles and criteria but also for exploring them on their designs.

As educational training is the most important issue in serious games, the definition of the rules is critical point of the game design process. In this case, specifying the main criteria for the game design has been the starting point of the PUDCAD project. Thus, the first step of the project, was organizing the local workshops by all the partners to understand, identify, explore the main principles and codes of U. D. design. These workshops aim to experience universal design criteria by the design students at chosen schools and identifying cultural variables if there is any. The first local workshop was organized by POLIMI, Italy open to all partners as a plot study. We chose two schools to focus on. One of them is ITU Development Foundation Middle/High School (Istanbul) on which U.D principles applied recently. The other one is SERÇEV Vocational High School (Ankara) which was designed and built following the U.D principles as an inclusive school.

STUDENT WORKSHOPS

Istanbul

Ankara

Two student workshops were conducted on the 13th and 18th of April 2018 with students from different universities in two different high schools, in two different cities; Istanbul and Ankara. Students analyzed the accessibility levels for each institution through empathy experience and compiled an accessibility check-list survey.

The first student workshop took place in Ankara on 13th of April 2018, with the participation of the PUDCAD project partners; ITU and The Association of Occupational Therapy. The chosen school for Istanbul was ITU Development Foundation Middle/High School. The building was adapted for accessibility. ITU Interior Architecture Students and tutors from ITU, department of Interior Architecture and The Association of Occupational Therapy made an empathy experience in order to analyze if the adaptation is well enough for everybody or it still has some parts to be improved. Istanbul workshop was mainly based on empathy experience. Students were split in 2 groups; each group was given a specific task utilizing the given equipment. The predefined areas as classrooms, toilets, canteen, library and also the barriers and ramps existing in the open areas had been analyzed depending on the accessibility criteria through observation an empathy experience with the help of given equipment among which there were several tools as a wheelchair, crunches and a walker.

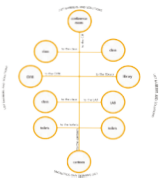
The second student workshop took place in Ankara on 18th of April 2018, with the participation of the PUDCAD project partners; The Association of Occupational Therapy and the Association of Children with Cerebral Palsy (SERÇEV). The institution in Ankara, SERÇEV Vocational High School, is a pilot school and a model for inclusive education. Students from TOBB University department of Interior Architecture and Hacettepe University Department of Occupational Therapy took part and analyzed the various spaces in the school in terms of accessibility. In this workshop, students from different disciplines collaborated and mainly based on observation acquired awareness on universal design principles.

METHODS

Checklist:

Students were asked to compile the accessibility checklist along with their notes especially on the non-working parts during both workshops. Checklist includes all spaces which are used by students. All of the places were analyzed in details by students. Survey was prepared by PUDCAD team with the leadership of POLIMI. It includes ADA and E.U universal design principles and codes. As we focused on the school design it was important to prepare the checklist only for the spaces in the schools. The main topics of the checklist are:

1. List barriers and solutions
2. To the Classrooms
3. Classrooms
4. To the Toilets
5. Toilets
6. Water closets in single user toilet room and compartments
7. Canteen
8. Library
9. Gymnasium
10. To the LAB
11. To the Conference room



Students took notes, listed barriers and give ideas on potential solutions.

RESULTS

The analysis of these surveys is shown in the RESULTS tab below. Through the given infographic information in the RESULTS tab, our aim was to demonstrate whether any accessibility considerations were applied for the given areas and whether these applications were efficient or prone to revision.

With these workshops, we have examined the current situation of applying U.D codes and principles to the buildings of private high schools in Ankara and Istanbul.

ITU Development Foundation Middle/High Schools is an active school since 2000. Even though they have made some interventions to meet the principles of Universal Design, some places like dressing room and the canteen cannot be used by the students with wheelchairs.

The partial ramps and stairs are connecting the different floors. Because the lifts are also narrow, accessibility between the floors are impossible for the students with limited mobility.

On the other hand, SERÇEV Vocational High School was designed and built following the U.D codes and principles. Nevertheless, there are still non-suitable place organization and furniture for students with mobility issues such as stands of the gym, library, canteen, hangers, classes. But, we also realized that life center unit was really important and essential space for the students.

Unfortunately, according to the results of the survey, both of the schools have non-working design solutions and none of them is hundred percent inclusive. This shows us, we need to disseminate the awareness of universal design in Turkey and we should start from the architectural and design students. They must learn the principles and how to apply them on their designs. Therefore, we believe the product of PUDCAD project; serious game will enhance the knowledge of students.

Another enlightening issue, Occupational therapy students collaborated with Interior Design students and they pointed out the problematic points which design students overlooked, during the Ankara workshop. This was an example for why designers and architects should work with different professions in order to design their buildings in accordance to U.D. standards.

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Practicing Universal Design Principles In High School Environment

Students with disabilities in Italian schools

Authors

Fiammetta Costa, Michela Rossi, Margherita Pillan
Giuseppe Amoruso, Giorgio Buratti

Politechnic University of Milan,
Department of Design, Milan, Italy

Introduction

Ergonomics is an essential discipline for the implementation of the social inclusion and non-discrimination targets set by the EU, but often not taught or considered marginal in designers training.

PUDCAD intends to remedy this gap providing an application that is configured not only as a tool for digital design, but as a real learning software. Through the implementation of playful dynamics, future designers will be able to internalize the principles of Universal Design and to develop solutions that consider different social groups skills and allow autonomy and equal opportunities for all.

Participation of Occupational Therapy Association of Turkey and SERÇEV, organizations with extensive experience in rehabilitative clinical practice and in supporting children with cerebral paralysis (pathology that includes different forms of motor functions impairment), has oriented research towards secondary education institutions. In fact, this period is considered a crucial moment in ensuring employability and consequent social inclusion for people with disabilities.

PRACTICING UNIVERSAL DESIGN PRINCIPLES IN HIGH SCHOOL ENVIRONMENT

Students with disabilities in Italian schools

POLITECNICO MILANO 1863

DIPARTIMENTO DI DESIGN

INTRODUCTION

PUDCAD is a project founded by the European Erasmus+ program which involves five European university institutes coordinated by ITU, Istanbul Faculty of Architecture.
The other participants are Institute of Design and Fine Arts, Lahti, Finland; Detmolder School of Architecture and Interior Architecture, Detmold, Germany; Architecture Department, Università degli Studi di Firenze, Italy; School of Design, Politecnico di Milano; Turkish non-governmental organizations SERÇEV (Association for Well-being of Children with Cerebral Palsy) and Occupational Therapy Association of Turkey.
The project is part of European Union cooperation actions for innovation and sharing of good practices which provides, at systemic level, the modernization and activation of educational paths through cooperation with partners from other countries and participatory approaches based on ICT. The activities supported by these key actions aim to acquire specific skills and to improve the students and young workers levels of preparation so that they can work easily in the different member states.
Among the actions promoted by Erasmus+, acquisition of civic and social skills capable of fostering intercultural dialogue, social inclusion and non-discriminatory active citizenship is fundamental.
The development of critical thinking, the knowledge of computerized media and the creation of new or better practices, is intended to provide for the needs of disadvantaged social groups and to cope with the differences resulting from geographical, ethnic and economic disparities.
According to the European Disability Office in the face of an increase in people with disabilities, integration into a normal life in terms of employment, education and mobility is still lacking in many states. Although there are many non-profit organizations and commissions that fight prejudice and discrimination, exclusion from normal social life for many people with disabilities begins with scholastic age. Based on these assumptions, the PUDCAD project aims to create a gaming platform based on CAD software which allows university students of the project disciplines (designers, engineers and architects) to learn and apply Universal Design principles in design practice.
The term "Universal design" outlines a design method that provides for environments fruition and products use regardless of age, physical abilities and/or user social condition. This philosophy, that beyond a few nuances of meaning is also called Design for All or Inclusive Design, is due to Ergonomics. Ergonomics is an essential discipline for the implementation of the social inclusion and non-discrimination targets set by the EU, but often not taught or considered marginal in designers training.
PUDCAD intends to remedy this gap providing an application that is configured not only as a tool for digital design, but as a real learning software. Through the implementation of playful dynamics, future designers will be able to internalize the principles of Universal Design and to develop solutions that consider different social groups skills and allow autonomy and equal opportunities for all.
Participation of Occupational Therapy Association of Turkey and SERÇEV, organizations with extensive experience in rehabilitative clinical practice and in supporting children with cerebral paralysis (pathology that includes different forms of motor functions impairment), has oriented research towards secondary education institutions. In fact, this period is considered a crucial moment in ensuring employability and consequent social inclusion for people with disabilities.

OBJECTIVES

PUDCAD offers a CAD based game platform for undergraduate design students to learn and adapt universal design guidelines into spatial experience and design practice. Although there are several BIM plug-in softwares and particular design applications with a limited access around the market, PUDCAD is intended to be developed as an innovative learning software, particularly for a student education. The main purpose of the project relies on the empathy and experience in universal design education and let students to develop a nuanced understanding for universal design practice through an digital game environment.

The main goals of PUDCAD are:

- to create a library that includes universal design related courses in design education, universal design principles, the basic and special needs of the students with disabilities in the school environments.
- to improve the competencies of architectural design students in finding accessible design solutions.
- to equip design students and tutors with a better knowledge of Universal Design.
- to trigger and promote the implementation of universal design standards on interior/architectural design practices in CAD based platforms.
- to increase the impact of the results via Conferences, workshops, publications.

PUDCAD will produce also an extensive set of resources.

- **Legal statues:** An exhaustively documentation of legal statues for Universal Design Principles will be done for all countries in Europe. Turkey will be a key point at this step to understand other countries' policies about this subject.
- **Curriculum Analysis:** The current design education curriculum of all partner universities will be documented to see what is the importance of universal design in design education.
- **Categorization:** Physiotherapists will categorize the disability levels of students at the selected schools.
- **Design criteria:** After documenting the legal documentations and feedbacks from physiotherapists will prepare the mapping for the students with and without disabilities. All of these works will specify the design criteria to be used in the game.
- **E-learning course:** Using Ninova web-based electronic learning platform, teaching materials, video lessons for the principles of Universal Design and the game will be launched to usage of students and tutors.
- **Game software:** The main outcome of PUDCAD will be an interactive universal design game for design education.

METHODS

The coordination among different nations' research groups is guaranteed by a program of transactional meetings, conferences and interdisciplinary workshops, where students actively contribute to implementation process. A task is assigned to each of the research institutes according to research specificity of each group. The program includes 6 phases:

1. **Analysis and documentation**
The first activity is the comparative analysis of legislation and accessibility policies in the different participating states. In addition the different teaching methods and principles of Universal Design are evaluated.
2. **Pilot Research**
This step involves the evaluation of each state's inclusion system. The research subjects are the secondary institutes, both as regards support practices through the evaluation of school environment accessibility and its correspondence to Universal Design principles.
3. **Scrutinizing the Game Database**
In this phase, the parameters that determine the digital application feasibility and operating principles are specified. This step includes a cognitive and emotional mapping and the evaluation by students, specialists and researchers of individual capacity levels relating to specific disabilities.
4. **Developing the Infrastructure**
This activity evolves the studied parameters in game inputs and it will allow the creation of first digital prototypes.
5. **Developing the Game**
In this phase, an Information Technology company will be involved. This operator will help the research group in application developing, in creating additional teaching materials and in studying interactive experiences on different media (computers, tablets and smartphones).
6. **Implementing the Game into Universal Design Curricula in International Education Networks**
This is the phase where, using also social media and technical conferences, the results and the application will be made known to the international didactic paths that train designers

WORKSHOP IN MILAN

The Milanese group was tasked with developing the pilot research. This step has been organized into several actions:

1. The construction of a survey and investigation method that, starting from the theoretical research carried out in the previous actions, makes it possible to verify the correspondence with the principles of the Universal Design of existing school buildings selected using different features of the school environment as measure.

2. The implementation of a Workshop involving 25 students from the 5 different Schools in a design competition. The students, organised in 5 international teams, are asked to design an inclusive high school environment encouraging students to develop innovative design ideas and to simulate the design process according to Universal Design principles.

The international workshop was scheduled for five days, with lectures and practical exercises alternating. The students were organized in groups of five people from five different countries.

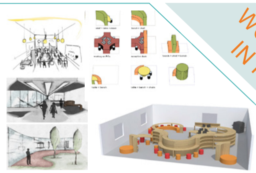
Day 1 Empathy Day
The empathy day was designed to allow students to experiment with various types of physical disabilities.

Day 2 Survey Day
The second day was dedicated to the survey. Using the specifically prepared check list, each team verified the accordance of the buildings' features to Universal Design principles

Day 3 Storytelling Day
During this day students where encouraged to reperesent the knowledge acquired in the prevoius steps integrating elements observed in real context with direct experience.

Day 4 Ideation Day
This was a full day of individual sketching and ideation around the selected opportunity areas, combined with sharing moments within the team to discuss and build upon each other's ideas.

Day 5 Project Day
The teams needed to prepare a 20 minute presentation of their final propositions. This step offered participants the chance to develop essential design team skills, being able to identify and agree upon the key messages around a concept.



SURVEY RESULTS

The survey method is based on the adaptation of checklist ADA (https://www.adachecklist.org/). This case-by-case basis reporting tool checks for accessibility requirements and standards, such as checking for ramps, access to restrooms, pay phones and other structures, to support people with disabilities and to identify barriers to accessibility in order to provide reasonable accommodation. This tool has been adapted to Italian legislation and it has been simplified for the application in the workshop.
The survey was carried out in several schools chosen on the basis of different parameters: construction year of the building, type of school and location in the city. The school were:

1. Scientific and Linguistic lyceum "Guglielmo Marconi"
2. Classical lyceum "Tito Livio"
3. High Education Institute "Enrico De Nicola"
4. High Education Institute "Falcone-Righi"- Lyceum "G. B. Vico".

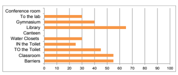
GUGLIELMO MARCONI
Residential area
947 Students
5 Movement-impaired students
23 Students with other disability

TITO LIVIO
Downtown
703 Students
3 Movement-impaired students
15 Students with other disability

ENRICO DE NICOLA
Outskirts
672 Students
(278 Art istitute+394 surveyor School)
4 Movement-impaired students
13 Students with other disability

FALCONE - RIGHI
Outskirts
1292 Students
(431 Lyceum+861 Education Institute)
3 Movement-impaired students
45 Students with other disability

COMPLIANCE PERCENTAGE G. MARCONI



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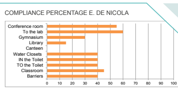

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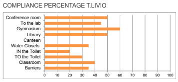
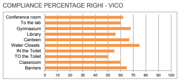


COMPLIANCE PERCENTAGE RIGHI - VICO



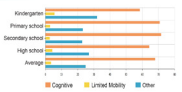
Source: Survey results

ITALY COUNTRY REPORT

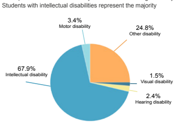
In 2016/2017 year the students with disabilities attending Italian schools were amount to 254,366, the 2.9% of the total number of students (8.7 million). Going into deep of individual school systems, the kindergarten presents, with 28,138 students with disabilities, the 1.9% of total attendants. In subsequent school orders, the students with disabilities' percentage is higher: in primary school it's equal to 3.3% and in the middle schools to 4%. Regarding tsecondary school, the percentage is the 2.5% of the total students number. In the high school, the percentage of pupils with disabilities in the total number of students is 2.5% if we consider only the public schools and 1.4% if we consider private schools.

SCHOOL TYPES	STUDENTS WITH DISABILITIES	TOTAL NUMBER OF STUDENTS	%
Kindergarten	28.138	1.518.843	1,9%
Primary	90.485	2.792.414	3,3%
Middle	69.470	1.729.226	4,0%
High	65.913	2.664.967	2,5%
TOTAL	**254.336**	**8.705.450**	**2,9%**

In the next tables students are divided by disability type respect to different kind of school: 96.1% of the total number of students with disabilities attending the state and non-state schools, of every order and degree, are carriers of disability psychophysics. Specifically 67.9% have an intellectual disability, 3.4% a mobility impairments a and 24.8% are carriers of another type of disability.



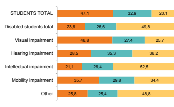
1.5% presents a visual disability and 2.4% a hearing disability. Students with intellectual disabilities represent the majority



Source: MIUR - DGCASIS
Statistics and Studies Office-Survey on schools

Disability in high school

Particularly interesting is, disabilities students distribution in different schools types. In Lyceum the percentage of students with disabilities is equal to just 1.2%, a percentage that is lower than high school average close to 2.5%. It is evident that students with disabilities are more present in technical schools with a percentage of 2% of the total number of students, and even more so in Vocational nstitutes where the percentage of students with certification reaches even 6.1% of the total attendance.
Ananalyzing disability different type, it is noted a considerable variations, in particular for visual disability, the percentage appears very highfor students who attend a Lyceum, reaching 46.8% of the total number. As regard to hearing impairment, the highest percentage is found in professional institutions (with 36.2%).
The intellectual disability is very present in the professional institutes, with as much as 52.5% of the total of the students 35.7% of students with mobility impairment attends Lyceum while the 48.8% of students with another type of disability the professional institutes .



Source: MIUR - DGCASIS
Statistics and Studies Office-Survey on schools

WORKTEAM

Fiammetta Costa
Michela Rossi
Margherita Pillan
Giuseppe Amoruso
Giorgio Buratti

Practicing Universal Design Principles in high school environment

Analysis of the experience, usability and inclusion in the Art School environment

Authors

Prof.ssa Francesca Tosi (Scientific responsible), Antonella Serra (PhD), Alessia Brischetto (PhD in Design), Ester Iacono (PhD student in Design)

University of Florence, Design Campus, Florence, Italy

Introduction

This study aimed to analyze the unusual nature of schools, strongly linked to an artisan and cultural history of the Italian country, to enhance the dimension of disability and analyze those activities that are not only intellectual but also creative, relational and social. In partcular "What are the levels of acceptability of current school facilities about universal design principles and to user needs and their abilities?". In the first phase, it was essential to make a census of the schools located in the Florentine territory, within which there were subjects with motor disabilities, but especially concerning the type of school.

Two schools have been chosen with a substantial laboratory footprint where there are classrooms, laboratories, used for artistic and creative activities and where students are moved from one class to another during school hours.

Practicing Universal Design Principles in high school environment

Analysis of the user experience, usability and inclusion in the Art School environment.

PUDCAD – Practicing Universal Design Principles in Design Education through a CAD-Based Game

TEAM

Laboratorio Ergonomia & Design

Scientific responsible
Prof.ssa Francesca Tosi

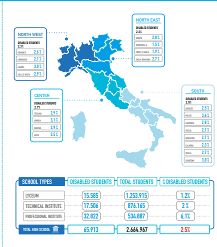
TEAM
Antonella Serra PhD
Alessia Brischetto PhD in Design
Ester Iacono PhD student in Design

PARTNER

DESIGN CAMPUS

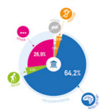
UNIVERSITY OF FLORENCE, DIDA, FLORENCE, ITALY

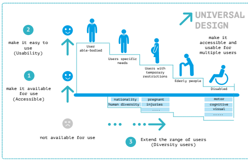
PERCENTAGE OF STUDENTS WITH DISABILITIES IN ITALY — HIGH SCHOOL | SURVEY YEAR: 2016/17



The data collected by the surveys on schools for the academic year 2016/2017 show how the total number of students with disabilities grew by 8.3 with 1.6% decrease in the total number of students attending Italian schools, registered in two years. About high school, the percentage of students with disabilities is 2.5% of the total number of 2.664.967 students. At the local level there is a different distribution of pupils with disabilities on the country's macro areas. The regions with the highest percentage are those located in central Italy (2.7%) and southern (2.5%). Among the individual regions the highest percentages are found in Abruzzo, with 3.6%, and in Umbria with 3.1%. In the following infographic, the percentages of students affected by the various types of disability have reported. The highest percentages concern for intellectual disabilities (64,2%).

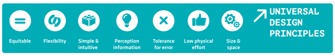
DISABILITY TYPES





USER IDENTIFICATION

The purpose of this research was to analyze the correspondence of the principles of universal design concerning Italian schools, in particular, the Tuscan territory. The approach to Universal Design allows us to consider the environment around us so that it can be accessed: 1. the maximum extent possible; 2. most independently and naturally possible; 3. in the broadest possible range of situations; 4. without the need for adaptations, modifications, assistance devices or specialized solutions, by people of any age or size or with particular physical, sensory, mental or intellectual abilities or disabilities; 5. in relation to electronic systems, any process based on on electronics for creating products, services or policies so that any person can use them. For this purpose, it is essential to understand who are the users in a specific context of use: the students, the teachers, the administrative and technical personnel, the family. Each of them may have specific disabilities, difficulties or needs (See the picture on the side).



ACTIVITIES

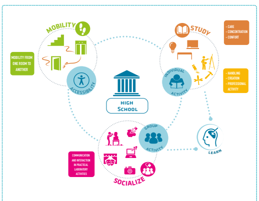
The observation phase allowed the definition of the following activities of:

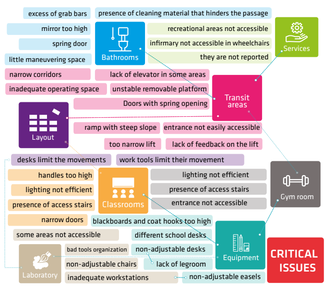
1. **study**, which involves the use of desks, blackboards, Lim, etc.
2. **laboratory** (painting, sculpture, photography, multimedia, etc.) which involves the use of trestles and specific equipment.
3. The observations were also made also referring to the **mobility** from one classroom to another for both disabled and non-disabled subjects.

The observation has shown how moving together can be a discomfort or an advantage, so it has allowed us to define how to share both the space and the connections between various spaces.

In this phase, we have considered the aspects related to light and space, but also the activities related to socialization and communication.

These considerations allowed us to understand how the environment and the place can convey the interaction between subjects.





Synthesis of critical issues analyzed

Aim of the work

This study aimed to analyze the unusual nature of schools, strongly linked to an artisan and cultural history of the Italian country, to enhance the dimension of disability and analyze those activities that are not only intellectual but also creative, relational and social. In partcular **"What are the levels of acceptability of current school facilities about universal design principles and to user needs and their abilities?".**

In the first phase, it was essential to make a census of the schools located in the Florentine territory, within which there were subjects with motor disabilities, but especially concerning the type of school.

Two schools have been chosen with a substantial laboratory footprint where there are classrooms, laboratories, used for artistic and creative activities and where students are moved from one class to another during school hours.

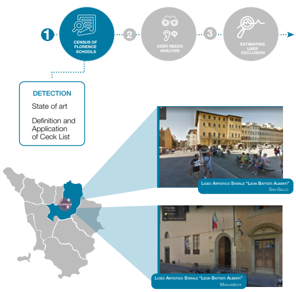
REQUIREMENTS

- Disabled users
- Laboratory activities
- Mobility
- Historical building

GOALS

- analyze the unusual nature of these places (artisanal);
- valorise the disability's dimension
- analyze the activities

RESEARCH STEPS



Methodology

In the second phases, we have used evaluations of the user experience and usability of space, products, and systems that characterize these environments. In particular, direct **observations** were made within the two classes in 3 days during the workshop activities (painting, drawing, etc.). During the didactic activities, it was possible to observe the students by filming, photographing and pinning every single action they performed. The observation was direct without any interaction with the observed subjects, to define, in a first phase, the criticalities or the peculiarities of the environments.

Later it was decided to use the **Thinking Aloud** technique which allowed a more in-depth observation with disabled students. The students were asked to express, aloud, what they thought while doing the required tasks, but above all to bring back their emotions, their frustrations and perplexities. Teachers and support staff have also been subjected to interviews within the school context. The goal was to get more information on how to interact with the school space. Also in this phase, it was possible, in a whole day, to implement the **empathy trial**, a series of simulations performed by 2-3 students who carried out activities and wheelchair routes. These operations were filmed and recorded. The routes (access to the structure, the classrooms, the toilets and the common areas) and the activities (laboratory teaching) to be carried out, were previously selected and explained to the students who independently performed all the stages of the test. The students involved, in addition to expressing their difficulties, during the test, were observed not only by researchers of the LED laboratory but also by other 2-3 students.

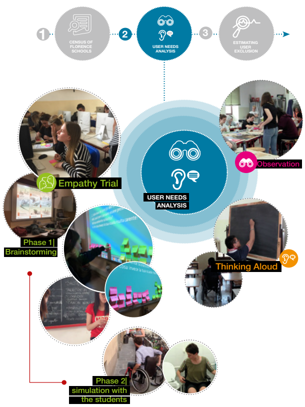
This model, compared to some thematic aspects, was reproduced within **brainstorming** in which the entire class group participated. These sessions were very interesting because, in addition to being educational moments, they allowed the introduction of the principles of Universal Design, the enhancement of the concept of inclusion and the knowledge of the possibilities offered by Design in improving the current situation.

METHODOLOGY

- Observation
- Thinking Aloud
- Task Analysis
- Empaty Trial

GOALS

- Dimensional requirements
- Safety requirements
- Layout and quality
- Inclusion Parameters
- Best practices



CRITICAL ISSUES

RESULTS

The analysis phase, through the application of usability evaluation methods, allowed us to identify a series of critical issues encountered within the school context. It was possible to identify 7 critical areas related to the spaces and activities carried out: the transit area (entry, corridors, ramps, stairs, lifts), the classrooms, the bathrooms, some services, the laboratories, the equipment, the layout, the gym room. In general, the main difficulties encountered concern accessibility to the structure. The Transit areas, in general, are not very accessible. In a school, the presence of stairs to the entry makes entry into facility difficult. In the other school, it has inserted into a removable platform that is unstable and unsafe. Also, the entrance doors are spring-loaded, and therefore they are difficult to keep open during the passage. The lift in both schools is tight, uncomfortable and does not immediate excellent visual and hearing feedback. Furthermore, access to the various classrooms limited by narrow, dimly-lit corridors. Some classrooms/laboratories/-gym room aren't accessible due to the presence of stairs and the equipment used are not available to everyone: the workstations (desks, chairs, and easels) are not adjustable in height, the blackboards and the coat hooks are too high, and the furniture layout inside the classrooms limits student movements.

The bathrooms have limited maneuvering spaces, spring-loaded doors, too many grab bars, too high hygienic accessories (mirror, soap dispenser, etc.), cleaning equipment that hinders their passage.

Overall the second phase has allowed us to define the interaction's methods between disabled and non-disabled students, and to experiment with ways of sharing critical issues in a new manner. This third phase allowed us to find the critical points by comparing them with the 7 principles of universal design. This approach has allowed us to identify interesting design scenarios, subsequently, the subject of discussion in the future, based on the objectives of the PudCad project.

Practicing Universal Design Principles in high school environment

A case study on the example of German high school architecture

Authors

Prof. Dipl.-Ing. Ulrich Nether, Katharina Bieker (B.A.), Jan Phillip Ley (M.A.)

OWL University of Applied Sciences and Arts, Detmold School of Architecture and Interior Architecture, Detmold, Germany

Abstract

Those analysis show that architecture and the design of the interior can play a significant role in the inclusion of minority groups and always works the best if it is part of a holistic spatial concept that tolerates and supports heterogeneity.

The study locates accessibility, the support of orientation by information systems and a clear architectural language, the consideration of Universal Design criteria with simultaneous creation of spatial qualities as well as the use of digital technologies and media as a multisensory extension of tangible learning formats and environments as important key elements for German school architecture.

Additionally, the results show that the discourse on Universal Design in the context of high school architecture cannot end with the discussion on accessibility, but should rather be carried on to an open debate on the responsibility of all key actors from politics, architecture and education, in order to develop strategies on the prevention of exclusion.

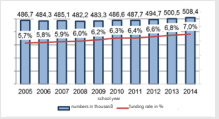
Practicing Universal Design Principles in high school environment: A case study on the example of german high school architecture

ABSTRACT

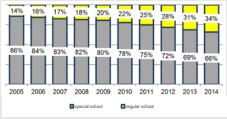
Paragraph "3.2 Education" of the "Nationaler Aktionsplan der Bundesregierung zur Umsetzung der UN-Behindertenrechtskonvention 2.0" (NAP 2.0) states to reduce the system of special schools in order to enable inclusion and support equal education for students with disabilities in regular schools. Focusing on the target group of high school students with different levels of cerebral palsy, the study investigates on the role of school architecture as a potential catalyst for inclusion. By interviews and the use of a checklist, that is based on the Principles of Universal Design, we evaluated the status-quo of German school architecture on the example of two high school buildings in Lippe, Germany to evaluate the requirements for the desired goal of the federal government. Those analysis show that architecture and the design of the interior can play a significant role in the inclusion of minority groups and always works the best if it is part of a holistic spatial concept that tolerates and supports heterogeneity. The study locates accessibility, the support of orientation by information systems and a clear architectural language, the consideration of Universal Design criteria with simultaneous creation of spatial qualities as well as the use of digital technologies and media as a multisensory extension of tangible learning formats and environments as important key elements for German school architecture. Additionally, the results show that the discourse on Universal Design in the context of high school architecture cannot end with the discussion on accessibility, but should rather be carried on to an open debate on the responsibility of all key actors from politics, architecture and education, in order to develop strategies on the prevention of exclusion.

PARTICIPATION REPORT of the federal government

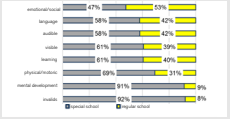
increase in numbers of children with special needs



decrease of special schools



special educational support isn't primary sustaining physical and motoric development



funding priority	overall	
	amount	proportion
Learning	116.038	34,60%
visual	4.787	1,40%
audible	10.734	3,20%
language	31.812	9,50%
physical and motoric development	24.621	7,30%
mental development	74.482	22,20%
emotional and social development	38.318	11,40%
general funding priority	14.019	4,20%
no assignment	9.724	2,90%
invalids	10.463	3,10%
overall/in total	335.008	100,00%

- **„reduction of numbers of special schools in order to enable inclusion and support equal education for students with disabilities in regular schools"**
- **49 funded actions, only one is dealing with the role of architects („Raum und Inklusion") (NAP 2.0)**
- **in pre-primary sector inclusive education is largely implemented: 87% of kids with disabilities are supervised in regular day care facilities. Only 13% are supervised in day care facilities for children with special needs (NAP 2.0)**
- **in high school education the two systems are strongly divided. Only 28% of pupils with special educational needs attends regular schools. (NAP 2.0)**
- **the type of disability is focusing on learning and mental development. Only 7,3% of the students have issues with physical and motoric development**

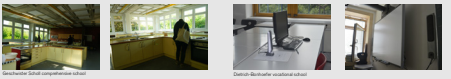
SCHOOL PROFILE ON SURVEY BASIS

	Geschwister Scholl comprehensive School (GSS)		Dietrich-Bonhoeffer vocaional college (DBB)	
number of students	1100 students		1100 students	
students with mobility impairments	physiological: 1-2 students		no information, students don't have to anounce disabilities	
number of students with mobility disability in the last five years	maximum: 5 students • most children with disabilities attend special school • children with special needs who attend to regular school have often parents with great commitment • the proportion of children with mobility impairments stay the same • the proportion of children with behavioural problems increase	Geschwister-Scholl comprehensive school	• large proportion of not noticeable disabilities • an epileptic seizure happened to a student on a class trip	Dietrich-Bonhoeffer vocational college
measures that have been taken through the last five years to improve the accessibility of the school and of the spaces within the school	• no measures have been taken since the school building was planned as an accessible environment	(Christoph Trappe, principle Mrs. Metzmacher, coordinator for common learning)	by reason of discretion the inclusion officer takes preventative actions • with a welcoming text they try to welcome and respect every culture (high propotion of foreign students who attends to special schools: 11,2%) • bold wayfinding/ guiding system	(Michael Düchting, inclusion officer)

COMPARISON | research and methods

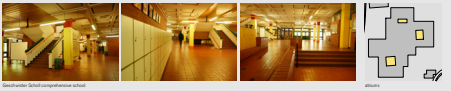
ACCESSIBILITY vs SOCIAL | entrance

PHYSICAL vs DIGITAL | LEARNING TOOLS | housekeeping lab, digital classroom



- tangible qualities of space and objects increase qualities in interaction
- multisensoric environment
- digital tools can be adapted to persons with special needs
- digital technologies can increase the accessibility to communication

PERCEPTIBLE INFORMATION | navigation and orientation



- usage of light as wayfinding system
- healthy environment: improvement of spatial quality using atriums (the atriums aren't used)

Accessibility	GMFCS Level 1		GMFCS Level 2		GMFCS Level 3		GMFCS Level 4		GMFCS Level 5	
	GSS	DBB	GSS	DBB	GSS	DBB	GSS	DBB	GSS	DBB
Main Path										
Main Entrance										
Alternative Entrance (emergency exit)										
Door Equipment										
Clear Path										

without constraints
with constraints
inaccessible

UNIVERSAL DESIGN vs SPATIAL QUALITY | canteen

Accessibility	GMFCS Level 1		GMFCS Level 2		GMFCS Level 3		GMFCS Level 4		GMFCS Level 5	
	GSS	DBB	GSS	DBB	GSS	DBB	GSS	DBB	GSS	DBB
Main Path										
Main Entrance										
Alternative Entrance (emergency exit)										
Door Equipment										
Clear Path										
Every Desk										
Every Area										

CONCLUSION

- The comparism of the entrances show that current standards are different and can increase inclusive effects if they are already part of the planing phase of the building process. Accessibility always influences social interactions.
- The example of the cantine shows that there can be contradictions between the fullfillment of Universal Design Principles and spatial qualities.
- Wayfinding plays an important role for the navigation and orientation especially in the functional zones of the school environment. High contrasts in color and materials as well as the presence of natural light can create a healthy environment. Additional multiensual/ -lingual information can affect the personal autonomy.
- Tangible qualities can increase qualities in interaction. The use of digital technologies can be including for everyone as long as they don't result in a lack spatial qualities that give space for identification.

Team: Prof. Dipl.-Ing. Ulrich Nether, Katharina Bieker (B.A.), Jan Phillip Ley (M.A.)

Hochschule Ostwestfalen-Lippe
University of Applied Sciences

Accessibility in Lahti High Schools

Authors

Mari Lehtiö, Mirka Pellikka, Henna Saarela, Nicole San Juan (students)

Lahti University of Applied Sciences, Institute of Design, Lahti, Finland

Introduction

Kannas School
Renovation brought the building up to standards and by our research is a great example of an accessible high school. Because of the good accessibility options around the school, it's been a positive experience for new students and a top pick for a person in a wheelchair. The school staff is informed about helping students with impairments and do what they can to ensure a normal school experience for everyone.

Tiirismaa School
Being situated in a public building, is up to the standards as well. It is by us presumed that students attending to school are taught how to use the spaces utilized by the school. Some of the details in spaces are indeed outdated.

There's a trend of renovating and closing old school due to urbanization and air quality issues. Both schools that were studied represented this trend in their own way. A statement has been made by City of Lahti to merge Tiirismaa and Kannas schools together.

Lahti University of Applied Sciences, Institute of Design, Finland

Accessibility in Lahti High Schools

Students: Mari Lehtiö, Mirka Pellikka, Henna Saarela, Nicole San Juan

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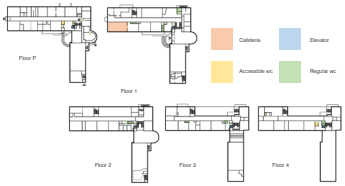
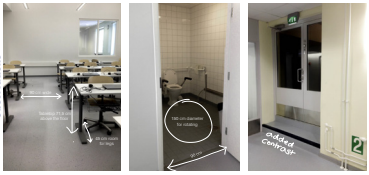


Kannas Upper Secondary School

1907 Established in Karelia
1910 School building in Karelia by Yrjö Sadeniemi
1940 Moved to Lahti before WWII
1952 School building in Lahti by Annikki Virtanen
2004 Middle school moved and works only in upper secondary education
2009 School building was renovated and brought up to standards (by H&M Architects)

- Total of 750 students
- Currenly there's one student with mobility impairments
- The student uses wheel chair
- The school has had two students with reduced mobility in five years
- They've arranged own desks and spots in the cafeteria for wheelchair users
- They've took people with reduced mobility into special consideration in fire drills

Observations



User Interview

Evelina
Age 17
Grade 2
Wheelchair user

"

- Manages mostly by herself. Has an assistant and friends also help. She thinks the school is well designed. She also feels the school takes care of her needs.
- Parents or sometimes a taxi brings her to school. The school is easily reached by car.

- The school works very well for her. If a problem arises, the staff does their best to fix it. Only thing causing problems occasionally is others' unnecessary use of the lift.
- It doesn't take any longer to take her route than to take the stairs. There is an accessible toilet in every floor.
- She would make improvements in fire safety and evacuation planning, they should be thought better to be accessible.
- As Kannas School is the best and only accessible high school. Some schools are in her opinion even impossible to a wheelchair user. Improvements have been done, but usually not thought well until the end. Schools should be improved, so everyone could have a equal choice of school.

"

Kannas School
renovation brought the building up to standards and by our research is a great example of an accessible high school. Because of the good accessibility options around the school, it's been a positive experience for new students and a top pick for a person in a wheelchair.

The school staff is informed about helping students with impairments and do what they can to ensure a normal school experience for everyone.

2

Tiirismaa High School

Temporarily operates on the premises of Lahti Adult Education Centre with open university, summer school and student health services

1908 Established in Lahti
1923 Moved into building by Eliel Saarinen
1964 Moved into building by Keijo Petäjä
1984 Lahti Adult Education Centre was finished by Arto Sipinen
2000 Established as an high school
2015 Moved into Lahti Adult Education Centre due to water damage and mold issues in the old building

- Total of 390 students
- Currently there is one student with mobility impairments
- The student uses a wheel chair
- The school has had three students with reduced mobility in five years
- In the past five years they've built an elevator because there will be an wheel chair student in the future.
- The real estate services of Lahti city is responsible for the changes to be made in the school to improve accesibility.

Accessible Restroom Details

Tiirismaa School
being situated in a public building, is up to the standards as well. It is by us presumed that students attending to school are taught how to use the spaces utilized by the school. Some of the details in spaces are indeed outdated.

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page 160-161·
106 | workshop participants test accessibility of the campus with the help of wheelchairs


MEYRA

Can the design of spaces catalyse inclusive effects in the educational sector by producing architectural environments, which create social relations that are accessible for everyone? What are the tools that will help future designers to develop a sense of social responsibility for their design?

The Universal Design Practice Conference 2018, as part of the ERASMUS+ PUDCAD project, discusses new strategies of thinking and making that can create spaces of learning that not only facilitate inclusion but also promote diversity.

TH OWL TECHNISCHE HOCHSCHULE OSTWESTFALEN-LIPPE UNIVERSITY OF APPLIED SCIENCES AND ARTS

perceptionLab