

Diversity as a catalyst for co-constructing knowledge holistically: Transforming experiences within an innovative research Living Lab known as MALL (Mall As Living Lab)

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Abstract: Adapting a public space for people with a disability can be challenging. When people want to get together in a place such as a shopping mall, they want to have the same activities as anyone else. Yet for people with disabilities, social and physical barriers may prevent access both in terms of physical environments. When considering spatial and social contexts, we will present what happens when people from such diverse backgrounds as development, commercial and rehabilitation come together with sociologists, anthropologists, design and rehabilitation researchers to create a Living Lab known as the MALL (i.e. Mall as A Living Lab), to create inclusive environments in the urban public space of the shopping mall. Results of two pilot studies (out of over 30 studies conducted thus far) are presented and, alongside the research, a parallel design exercise with students explores potential inclusive design concepts. Results reveal issues of access, enhancement or prevention of social experiences through the readability of the mall and what specifically hinders social integration within the design of the interior environment. Student examples of such work demonstrate how research informs decision-making in design—situated concept development of potential solutions for the spaces of the MALL. The conclusion elaborates how design thinking can be infused with research, and the how researchers' perspectives on rehabilitation practices comes together with those on the environment and its design.

Key words: *Living Lab, inter-disciplinary research, participatory action research, re-adaptation, enabling environments, collaborative design, collaborative research, accessibility, social inclusion, design concepts, inclusive interior spaces*

1. Introduction

This paper explores the concept of a research laboratory that is a “Mall as a Living Lab” (MALL), where the engagement of diverse aspects of research and design occurs through the activities of an interdisciplinary and multi-sectorial project called “A Rehabilitation Living Lab: Creating Enabling Social and Physical Environments to Optimize Social participation of Persons with Disabilities”. This research project has amongst its goals promoting well-being through social inclusion and participation in the daily activities that people engage in within the public spaces of shopping malls. This project aims to understand what happens when people from such diverse backgrounds as development, retail, and rehabilitation come together with sociologists, anthropologists, designers, architects, engineers, industry partners, people with disabilities and various rehabilitation researchers to create a Living Lab known as the MALL (Mall as a Living Lab), the first of its kind in North America. Innovating in this Lab means doing research using different strategies within virtual and real life situations, while proposing

solutions developed for users to achieve what is needed to better integrate physically and socially in real life situations. Co-constructing knowledge within a public-private-people partnership for the purpose of developing new and innovative solutions for social inclusion and participation for users with disabilities means understanding peoples' experiences in the Living Lab. Who are the people who would like to frequent the mall and what would they like to achieve?

One of the principal goals of research in this Living Lab is to better understand how people with disabilities are users as much as anyone else, and how they understand, navigate and perceive a public space such as a commercial shopping center. Who are they? What do they want to accomplish and under what kinds of conditions? The research is aimed at revealing these issues while ultimately adding to new and better knowledge of a public space both as a socio-cultural place where people live and interact, but also how this directly interacts with the design of that space. Another goals objective is to understand how the design responds to the needs of people with disabilities. Is our design of interior public spaces really universal? While interior architectural environments are always designed to local and national code requirements for accessibility in Canada and the United States, these same environments may not always be accessible in the universal sense [9]. How do universal principles allow a design to be inclusive? We are interested in understanding empirically the quality of environment as a living place. Finally, the Living Lab is an opportunity to see how we can construct new knowledge in a complex and dynamic environment. The Living Lab is at once a lived space, a research place and becomes an observatory, where researchers from different backgrounds can work together to develop innovative tools and practices to achieve these goals. The 'research object' can be thus be seen from multiple points of view, where the knowledge constructed together allows for a better understanding of a phenomenon, in a constructivist perspective [17, 15].

This paper presents the results of two pilot studies conducted within the MALL. Here, researchers, participants and collaborators co-construct knowledge regarding what constitutes an 'enabling environment' within an urban shopping mall for people with disabilities, what is the existing environment of a public mall such as the site of the Living Lab, in terms of social accessibility and supportive design, and what potential interventions and solutions can be realistically implemented. The researchers consider the Living Lab as a physical space and also consider how people experience the space as users both for personal and social reasons. Meaning emerges from real life situations [3] as they become part of how we understand a place, accomplish tasks or just experience a place we are living in at the moment, whether this is at home or in a public space such as a shopping mall. These user experiences and the research data collected are done "in-vivo" to glean information about real-life situations and to uncover specific social and/or personal issues that emerge through the research. First, the concept of the Living Lab is conceived as a co-construction of research with the overarching approach of co-operative inquiry [8]. Researchers, stakeholders, users and people who work in the mall are engaged in research that is "in-vivo" in that the research proceeds with all stakeholders examining the Living Lab through their unique perspectives and experiences. Second, this research occurs in the framework of action research [17], in that perspectives and methods uncover issues during walk-about where the experiences of the space occur in real time. The conversations with the perspectives of users and various people who visit the MALL are of value, as we seek to understand the lived stories (as narrative) of people in the context of issues and obstacles faced both physically and socially, and as these actions are happening in the mall. The mall is a space of experience, of services, and of engagement and is a place where lives, emotions, and interactions take place.

This paper presents an overview of the MALL project and its objectives. It also presents results from two pilot studies and the parallel design activity. These two pilot studies are: 1) Pilot study 1: user needs and experiences assessment; 2) Pilot study 2: accessibility of the mall environment.

Research methods used include the visual documentation of existing physical conditions and documentation of first person accounts of lived experiences. Visual and narrative data are collected and analyzed as follows:

- i) Preliminary assessment of the physical conditions and establishing metrics about the spatial characteristics and user needs and activities;
- ii) Interpretive methods explore the first person perspectives of experiences in walk-about in the mall with researchers uncovering issues within the mall from their perspective;
- iii) What emerges in the data analysis in terms of salient issues and themes that show how physical and social issues contribute concurrently to the issues of access and ability of disabled persons to adapt well to the environment.

Parallel to these research activities, and to be able to respond promptly to stakeholders' concerns for a commercially viable place, design students consider potential scenarios for the inclusive concepts of the mall public spaces from both the physical and social/personal perspectives. Students study the spaces and the research and explore possible scenarios, for creating inclusive design concept solutions for the spaces of the mall. Examples show what happens when design thinking is infused with research, and how the 'researchers' perspectives on rehabilitation practices come together with perspectives on the environment and its design [13]. The concepts proposed offer possibilities for users and stakeholders alike, as a means to conceptualize potential ways of creating an inclusive, accessible, and aesthetic space that "does-not-yet-exist" [12]. The conclusion discusses ideas about future research initiatives for the Living Lab.

2. The Mall as a Living Lab (MALL) research project

In the spring of 2011, 10 researchers and approximately 45 collaborators and partners came together to create the MALL: Mall as a Living Lab. The researchers are members of the Centre for Interdisciplinary Research in Rehabilitation (CRIR). Spearheaded by Dr. Eva Kehayia and Dr. Bonnie Swaine, this multi-sectorial and multidisciplinary strategic development project was conceived with the overarching aim of "[...] transforming an urban shopping mall into an inclusive environment for individuals of all ages, especially for those with physical, sensory and cognitive difficulties." [10]. By Living Lab, we refer to the concept of "...a user-centred, open-innovation ecosystem, often operating in a territorial context (e.g. city, agglomeration, region), integrating concurrent research and innovation processes within a public-private-people partnership."¹ In this research, the MALL becomes a « Living Lab » as both a space of research and development, of innovative and technological solutions and as a physical and virtual space/platform for experimentation, research and design.

2.1 Objectives and brief overview of the Living Lab

From the onset, the vision for the Living Lab has been to create an enabling environment to optimize social participation and inclusion for all individuals, grounded and stemming from leading edge research, and to create a Living Lab within the urban environment of a shopping mall in a downtown city centre [10]. This project has three objectives.

¹ Definition of Living Lab retrieved from: http://en.wikipedia.org/wiki/Living_lab. [Accessed 2nd July 2013]

- 1) Identify the environmental, physical and social obstacles and facilitators for participation (shopping, meeting with friends, etc.) in the MALL;*
- 2) Develop technology and interventions to optimize physical and cognitive function, social participation, and inclusion of persons with disabilities;*
- 3) Implement and evaluate the impact of technology and interventions in-vivo (i.e. in the living lab) on physical and cognitive function, social participation and inclusion for persons with disabilities.*

With these objectives in mind, the MALL project is organized using the following overarching structures: i) Organizational structures for the Living Lab activities; and ii) Working groups for the evaluation of outcomes.

Briefly, the organizational structures include an Executive Committee (the 10 core CRIR researchers) and an Advisory Committee (6 members from various stakeholder groups) to support the 50 MALL researchers, graduate students and multiple projects conducted in the Living Lab. Furthermore, the researchers meet regularly with the mall owner representative, to explore ways the Living Lab can engage in the issues driving the research and to coordinate the ongoing research and renovation activities in the mall, reinforcing the interactivity between mall stakeholders and researchers.

The evaluation structures include a) A statistical and evaluation working group (spearheaded by S. Ahmed) to provide a structure for designing, implementing, and evaluating interventions and programs to meet the overall objectives of the MALL project and to connect between the specific methods, goals and outcomes of the diverse projects and disciplines involved; b) A Community of Practice group (CoP, spearheaded by B. Mazer and D. Kairy) whose goals are to share and understand different stakeholder perspectives to co-create culturally appropriate knowledge/research in order to effect change; and c) Coding and mapping the different projects according to the ICF (i.e. the International Classification of Functioning, Disability and Health), which is an international classification system developed by the World Health Organization [19] with the goal to provide a unified picture of the objectives and deliverables of the projects as well of the feasibility of the proposed adaptations to the physical and social environment of the Living Lab.

2.2 The “Living” Nature of the Lab

In the first two years of the MALL project’s inception, over 30 different pilot studies were conducted to determine baseline evaluation of the existing site, spatial issues and cognitive reactions to the current environment, alongside metrics of the conditions that generated obstacles and facilitators within the environment for people with a wide range of abilities and ages by various research teams. These multiple pilot studies have been conducted to understand cognitive, auditory and visual issues, as well as physical obstacles and barriers to social participation and inclusion. They will also provide the groundwork for future inter-sectorial research projects and help envision ways to transform the public spaces, in terms of design process and creating environments that respond to the strategies needed for social inclusion and participation.

As the MALL is an open-ecosystem and changing almost daily, early pilot studies are organized broadly around two concepts: a) to document and establish metrics of the environment and its users; and b) to document and evaluate physical public spaces from perspectives of visual, sensory and motor issues of people using the mall. Researchers have also identified broad overarching themes: 1) Experiencing the mall; 2) Navigation and/or way-finding in the mall; and 3) Activities and/or interventions in the Mall [10].

2.3 The collaborative nature of the Living Lab and co-constructing new knowledge together

Within this framework and structure, people are collaborating from multiple research and pragmatic perspectives. The combination of public institutions with private developers and people is both co-operative and

participatory. Collaborating together is inherent in these studies, in terms of both the contribution of industry and government, as well as with the participation of both stakeholders and users who engage with researchers and industry partners to create virtual research platforms within real, physical mall conditions. Therefore, as the Lab is a living and changing place of research using industry and government partnering with researchers and users as collaborators, the mall is also physically changing as it begins to undergo renovations parallel to the MALL activities. As the projects develop, research results of pilot studies are considered in the design of the mall by both students and stakeholders.

2.4 The design studio aspect of the project

While the objectives of the Living Lab have as their goals both clinical and technological results that are research driven, there are also design objectives explored in design studio in parallel to the research. Early data collection and data collected in the pilot studies presented reveal issues in the physical environment that are then explored with students in the design studio in a parallel exercise in the MALL. Students from the Interior Design program at the School of Industrial Design at the University of Montreal in Montreal, Canada, collected information about the design issues within the mall, interviewed participants and users, and developed a design problem in the context of this Living Lab and the shopping mall as a branded environment for consumers. Students then considered this research in the context of problem-based learning, by understanding the complex nature of this type of interior environment, the inclusive needs of users and what universal principles might be applied in proposing concepts and solutions for the interior spaces, and creating different design scenarios to solve in the mall environment. Students provide ideas and concepts for potential solutions through aesthetic, creative design concepts that also respond to functional and universal design issues [11, 16]. The students engage in the research to uncover issues, develop scenarios with the mall stakeholders and users, with the aims of understanding how proposed designs take into account social and cognitive relationships of users with the interior environment, and using the mall as a blueprint for exploration of possible design ideas as ways to transform the existing spaces. This “design thinking” concept is grounded in the idea of envisioning the “not-yet-seen” through design thinking and doing [12] while integrating research results to better inform design decisions that also transform the spaces [16,15].

3. Theoretical context for the methodology

From the outset, the creation of the MALL project stimulated research to understand what happens to people with disabilities in real life situations. For them, going to the mall to go shopping or to meet a friend is as vital an activity for social connection as it is for everyone. What happens in terms of experience, however, is not so evident. Going to the mall with a friend, while a relatively simple experience for most people, becomes a major task for persons with disabilities. Couple this aspect of social inclusion with the realities of the commercial nature of the public spaces of the mall and things become complex due to the perspectives of multiple stakeholders. From the perspectives of stakeholders such as mall owners, the mall is a place of commerce and retail sales, leasing and branding. Moreover, there are many people who experience (or visit) a shopping mall with multiple goals and needs, from acquiring services to spending money to socializing or meeting together to doing business. Families and people of various ages and stages of life frequent malls for both personal and social reasons. At the Living Lab, there is a higher proportion of elderly living in the neighborhood and they may go to the mall as a social experience. People with disabilities and students also frequent the mall due to its proximity to a college and the

subway line, allowing for easy access, one would presume. However, the actual mall is a complex place, with problems of access inherent to the design of the existing space.

3.1 The research methodology and overarching perspectives for the two pilot studies

In the context of the Living Lab, and to accomplish the research goals as described, the research proceeds from the perspective of a constructivist framework supported by action research, using various documentary and interpretive methods to collect and analyze the various data required [6]. First, the overarching project structure is predicated upon the participation and inclusion of as many people and elements as possible to present an overview of the existing MALL space and the issues inherent in its use, from both a physical and personal/social perspective. To accomplish these goals, the overarching methodological approach combines documentation with action research, from a perspective of co-operative inquiry [8]. Co-operative and inclusive research [8] is used to situate the participatory nature of the projects and the pilot studies combine various stakeholders in cooperative situations during the data collection process, including the mall owner and people with disabilities who are daily users of the spaces.

Second, and at the outset of the research project through the pilot studies, the existing spaces are documented visually and from the perspectives of users with various disabilities using walk-about to determine the physical issues and to witness, in real time, the complexities of navigating the spaces from the perspective of two specific issues: reduced mobility and reduced visibility. Documentation of the space is done using design foundations, as a means to understand and record the physical environment in terms of both physical elements and also in terms of navigating the spaces and what activities and services mall stake-holders use.

3.2 About lived experiences and social meanings

Third, and from a phenomenological perspective, the personal and direct lived experiences of the user are considered in terms of their real, lived experiences within the mall. While experiences are repositories of meaning in life situations [3], as Berger & Luckmann suggest, they also create social meaning through the social interactions in the "...realities of everyday life" (p. 19) [4]. These experiences must be understood in the context of the direct, lived experiences of the people themselves. This is a form of action research, wherein the researchers accompany the users to understand the particular practices in the spaces that they navigate. As researchers, we seek to understand what Atweh and al [2] define in action research as:

"...a learning process whose fruits are the real and material changes in:

- what people do
- how they interact with the world and with others
- what they mean and what they value
- the discourses in which they understand and interpret their world" (p. 25) [2]

The walk-about that the researchers have with collaborator-researcher-users of the MALL have as their aims these objectives. Only through a real-time understanding of the meanings and values of what they understand in the world around them, can social practices and design elements as spaces of living be understood so that these, as Atweh et al [2] suggest:

"...become accessible for reflection, discussion and reconstruction as products of past circumstances which are capable of being modified in and for present and future circumstances." (p. 25) [2]

Walk-about record conversations of both users, in conversation and recording user narrative as this occurs, as lived experience in action and in the phenomenological sense.

In summary, to be able to construct a full picture of the users and their experience, the research data collection proceeds on three levels: I) Collecting information about the mall via interviews with various stakeholders to construct an overall portrait of the MALL; II) Documenting the space visually and based on the interviews and users descriptions; III) Understanding lived experiences of the mall through researcher-user walkabouts and conversations “in-vivo”.

4. The Two Pilot Studies

For the purposes of this paper we present examples of two completed pilot studies.

4.1 Pilot Study 1: User Needs and Experiences Assessment

This pilot study proceeded in three phases: 1) A preliminary physical space assessment; 2) A user needs assessment; and 3) Walk-about to glean user experiences. As the scope and depth of these studies is quite extensive, for the purposes of this paper we present an overview.

Preliminary Physical Space Assessment

The entire mall space was documented visually using photos and the existing space was verified. Three levels were documented with photos taken identifying the major circulation areas, materials, finishes, lighting and signage. Figure 1 shows an example of the existing interior:



Figure.1 Mall Interior Lower Level towards Ground Level

On each level of the mall, zones were identified as major circulation spaces in the public areas and the description of observations of the physical spaces, occupants and activities were provided. Emergent categories included:

- general state of the interior spaces, including arrival and entry points, comfort and ambiance, durability and security;
- activities and uses including circulation, services, primary and secondary activities;
- user types, including people coming to the mall from neighboring sites, transitory and permanent users, vulnerable populations;

- salient spatial elements that affect integration – materials, spatial characteristics, ambiance and spatial organization, lighting, circulation, façades of stores, kiosks, exits and entry points.

User Needs Assessment

The second part of the study consisted of collecting data on the descriptive characteristics of the space and its use in detail. The researchers and students conducted interviews, visited the site and consulted with designers and architects as well as users. The user needs assessment included the following data collection:

- interviews with users (persons with disabilities), shopkeepers and the mall owner representative and general manager of operations;
- interviews with designers and architects in walk-about of the mall identifying design issues in the existing space;
- photographing and identifying design elements for assessment in the mall, including full visual and narrative descriptive documentation of the three levels of the public spaces, major circulation pathways, spatial and design elements including materials, lighting, storefronts, and design features of the space on all levels.

Walk-about and User Experiences

Walk-about were conducted between researchers and diverse users in the existing mall public spaces. The conversations during the walk-about were documented using open-ended interviews. The users walked with the researchers together in the mall, and the participants described their impressions, as an action research approach implemented in the mall. Two analysis steps proceeded with the goal of understanding a) the mall issues from the physical issues and their design and the impact on well-being for users, and b) what users experience when using the mall and what is revealed through interpretation of the results. First, the mall is analyzed using an adapted version of Visual Content Analysis [18]. The visual photographs taken at the mall were compared to the narrative conversations first, followed by an in-depth analysis of the conversations themselves.

Second, the user experiences and mall issues uncovered were analyzed using a phenomenological reading of the conversations during the walk-about [17]. The conversations of the real-lived experiences were analyzed with a hermeneutic reading of the content of the verbal discussions, defined, as Price notes, as: "...a continuous review and reinterpretation of text." (p. 3-4) [17]. This analysis reveals overarching themes and issues that emerge during the walk-about at a particular point in time. The analysis proceeds with reading and rereading of the narrative texts to uncover overarching themes from multiple readings. Several issues that were uncovered were compared with the visual documentation of the mall, and overarching themes revealed specific issues about both about the mall spaces, accessibility, attitudes and potential ways to create more inclusive environments.

Findings – Pilot Study 1

The sets of findings reveal several issues within the mall environment, as shown in this sample of the lower level of the mall and shown in Table 1 below. First, the physical characteristics documented and analyzed reveal issues such as:

- general circulation and pathways are good, but the arrival at certain entrance points is not accessible (circulation);
- when circulating, flooring hampers navigation and way-finding as it is very high contrast; inability to "see" due to glare on the floor and this hampers visual stability when trying to orient in the mall (circulation, visibility, comfort);
- visual noise that hinders ease of comprehension of visual spaces (visual comfort);
- auditory noise that severely hampers understanding auditory cues;
- inability to foster inter-social skills using the mall features as guideposts.

Second, in the emerging issues that were revealed by the analysis of the walk-about and experience, examples of findings include these overarching issues:

- navigation and way-finding : difficulties vary widely depending on the disability;
- the perception of space : depends on the physiological characteristics of the person with the disability. For example, a person in a wheelchair cannot see the signage that is far away at the ceiling but can identify its placement, while the person with low vision cannot place the signage due to the visual noise that surrounds it;
- the issue of time and displacement: the presence of a subway station at the lower level entrance is appreciated for arriving at the mall. However, while the person with low vision can walk into the mall from the subway in about 2-3 minutes, the person in the wheelchair must leave the mall and enter through the college next door, go outside and reenter the mall, and this may take up to 45 minutes, depending on weather, crowds and so on.
- interactions with other people in the mall: generally people are friendly when walking around. However, difficulties arise when trying to ask others for help. Contact with store personnel depends on the store, and the knowledge of the employee serving the user (all types of participants).
- the mall is a place where participants like to meet, despite the issues in the actual space.

Table.1 summarizes the issues and the relationships between the documented data and the narrative emergent issues as these relate to the documented space:

Table.1 Analysis of the Mall Interior from both visual and experience perspectives

THE INTERIOR SPACE CHARACTERISTICS AND EXPERIENCES		
Data collection and analysis: physical space, user needs and experiences (example of data collection/issues comparative analysis)		
	Visual documentation of space	User experiences/walk-about
Arrival	Arrival and entrance – public circulation to and from major entry points	Arrival – no arrival point for persons with certain disabilities
Circulation	Circulation to stores	Circulation is relatively easy
Comfort	Comfort of the public spaces	-Comfort depends on perspective of person -Arriving it is not comfortable -Once in the stores that are welcoming things go well
Ambiance and lighting of the spaces	-To see the storefronts -To read way-finding signage	-Lighting is not welcoming, soft and does not help -Identifying the storefront is difficult -Cannot read way-finding signage

4.2 Pilot Study 2: Accessibility of the Mall environment

In this study two major elements were examined: the accessibility of the mall and the codes required to confirm the relative success of access in the existing space, and a study of lighting in the mall. For the purposes of this paper, only the lighting component of the study will be presented. The researchers recorded the lighting levels of the public areas of the lower level by tracking the lighting levels using a light-meter that records both illumination levels and relative space contrasts. Figure 2 shows the plan of the space and Table 2 lists the lighting levels for each point recorded.

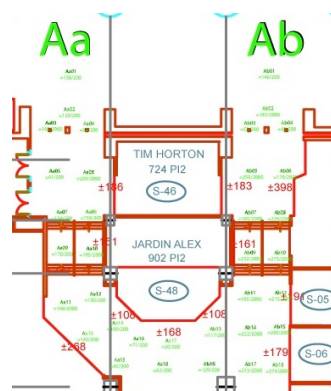


Figure.2 Lower level plan of lighting levels

Table.2 Lighting levels

Poi nts	Méto- Ouest- Ext	Méto- Ouest- Ext	Méto- Ouest- Int	Méto- Ouest- Int	Méto- Est-Int	Méto- Est-Int	Méto- Est- Ext	Méto- Est-Ext	Nor mes	IESNA (p.98)
1	138	110	138	110	146	137	146	137	100	Public circulation corridors
2	120	140	120	140	145	133	145	133	100	Public circulation corridors
3	195	38	34	42	53	52	43	36	100	Public circulation corridors
4	41	143	239	314	259	326	178	164	100	Public circulation corridors
5	124	116	158	153	185	190	229	202	100	Public circulation corridors
6	170	177	195	206	232	230	273	261	100	Public circulation corridors
7	148	207	130	224	195	260	215	255	100	Public circulation corridors
8	143	280	109	278	117	290	250	276	100	Public circulation corridors
9	42	84	71	153	129	137	274	320	100	Public circulation corridors

The data analysis reveals that the lighting levels vary greatly within the public space and are not consistent with the North American standards of the Illuminated Engineering Society for appropriate lighting levels for the public spaces [7]. In particular, the lighting levels vary from very low to very high and are often independent of storefronts or circulation paths. These physical elements cause confusion for people with low vision and this was confirmed in issues raised in the walk-about of Pilot Study 1. Lighting interferes both with being able to decipher words on signage and with being able to read the information on and within with storefronts, causing discomfort and an inability to read the mall information visually.

5. Emerging Results about Physical Spaces and Personal Experiences: Issues in the mall

By way of summary, multiple obstacles and issues were identified in Pilot Studies 1 (User needs) and 2 (Accessibility in the mall) with elements such as lighting and material choices, both causing issues of poor

visibility, lack of appropriate contrast, and generally difficult environments to navigate with ease. Despite generally favoring the ability to come to the mall from a transport perspective, participants expressed frustration at being able to arrive at the mall and easily find what they need. While this particular space was considered easy to get to due to public transit, the entrance at the lower level caused issues of access at the subway itself. Participants express frustration that although physically finding their way in the space is not inclusive and universal, they all mention that the virtual information provided for them to “remember” the mall was very helpful, information they used before they arrived, as a mental map. Furthermore, they felt that although people were friendly, social relations were cumbersome. In essence, they adapted to the mall even though the mall did not adapt to them as persons with disabilities [14].

6. Developing design concepts and possibilities of “what might be”

These early results were presented to students who explored the mall and issues of universal access. Students interviewed both mall developers and people with disabilities, and then using scenarios, developed potential concepts for envisioning the space with inclusive approaches. They asked questions and reflected upon what exists, what are the issues of both users and stakeholders, and what might be possible. Students integrated the research with design thinking and exploring possibilities as part of a more holistic design process for the interior space and potential concepts [16]. Figure 3 shows an example of one concept and its ideas expressed in the mall:



Figure.3 View of an Example of a Student Proposed Concept

7. Conclusion

Although the Living Lab is, in fact, a live and moving target with both physical and virtual platforms being developed with research projects for the future, certain results emerging already point to changes needed in the design of the shopping environment to better facilitate social inclusion and participation. Issues of access and ease of way-finding are accelerated by problems of poor contrast in both materials and in lighting levels. The examples provided by the 2 pilot studies present only a small sampling of issues and spaces in the entire Living Lab.

Future projects include: i) developing new types of spaces for all generations within the mall, ii) using cognitive and innovative technologies to stimulate people’s adaptability when moving around the mall as well as within stores, and iii) considering mobile technology aids to accompany certain users in their travels for way-finding purposes; iv) developing more in-depth understanding of the personal and social experiences that people have and how the design elements might assist in their better integration.

This unique Living Lab innovates through 1) its inter-sectorial and multi-disciplinary structural framework; 2) the inclusion of users both as research collaborators and as participants understood as active research participants in action research approaches; 3) the real-time experiences and considerations of results as these emerge is concurrent with the evolution of this “Living Lab” as a live platform of innovative virtual, real and technological strategies to optimize social inclusion and participation of disabled persons in ways that the MALL is a place for individuals of all ages and walks of life.

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Note: The definition of Living Lab is retrieved from http://en.wikipedia.org/wiki/Living_lab [Accessed 2nd July 2013].