# A Post Occupancy Quality Evaluation Model for Preschool Settings' Interior Spaces (PSIS)

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# ABSTRACT

The overall purpose of current thesis is to contribute a knowledge based on interpretation of transactional relationship between the design of educational spaces and patterns of everyday learning experiences. Based on the findings on the lack of evaluation models that controls the design quality of educational spaces against the requirements of learning experiences, this thesis establish a systematic path for shaping the design evaluation models that would concern the learning environment within interiors. With the growth of preschool education as compulsory education and increase in number of preschool settings, the researches focus on shaping a model for interior space of preschools.

The research is built upon accomplished researches and studies in field of education, design, architecture and environmental studies and reviews are conducted by using theme analysis, structured review and taxonomy analysis. This study includes three main stages of research: identifying the indicators of 'Quality without a Name' in preschool spaces, Definition of design quality in preschool spaces and Model proposal. In first phase the aim was identifying the requirement of evaluating the concept of 'Quality without a Name' in preschool spaces. Findings in this phase illustrate the subjects design of preschool spaces need to enhance their requirements. According to the findings educational program, children's learning and development, teachers' performance and parents' participation were defined as the indicators of 'Quality without a Name' and developmental based and holistic learning experiences were defined as communal path of learning experiences that keep happening in preschool settings. In second phase of the research design and arrangement of

preschool spaces is interpreted in relation to the requirements of identified indicators of ‘Quality without a Name’ during communal path of learning experiences. The theory that is established based on this interpretation shaped the theoretical background of the model. In final phase of the research the established theory in previous phase were classified into evaluation subsets and these subsets shaped the structure of the model. To accomplish this phase, the necessary evaluation techniques were identified for the identified subsets and final framework of the model were established.

The systematic path of shaping the model that is presented in this thesis may serve as a starting point for shaping post occupancy design evaluation models that would consider the requirements of learning environment in evaluating the design quality for educational facilities and improve the theoretical knowledge in this field accordingly. The conclusion suggests adoption of the model on variety of preschool cases to develop and improve the evaluation framework of the model instantly. A theoretical framework of current thesis shapes an interdisciplinary knowledge by connecting the field of interior design and education. This theoretical bridge would benefit both designers and educationalists to use the evaluation model and increase their awareness on consequences of the contrary discipline.

**Keywords:** Preschool Settings, Educational Spaces Quality, Early Childhood Environment Design and Arrangement, Children’s learning process, Everyday Learning Experience

# ÖZ

Bu tez çalışmasının temel amacı, bütünlüklü bir yaklaşımla eğitim mekanları tasarımını, günlük yaşamın deneyimlendiği örüntülere bağlı olarak yorumlamak ve değerlendirmekle bir bilgi donanımı kurgulamaktır. Yapılan çalışmalar sonucunda, eğitim mekanlarının tasarım kalitesini, günlük yaşamın gereksinmelerine göre değerlendirmekte olan bir yaklaşım (model) bulunmadığından bu tez çalışmasında, sözü edilen değerlendirmeler ışığında iç mekandaki yaşam örgütlenmesi de dikkate alınarak sistematik bir yaklaşımla değerlendirme modeli oluşturulmuştur. Okul öncesi eğitim, zorunlu eğitimin bir parçası olarak kabul edilmekte olduğundan, söz konusu eğitim yapıları artış göstermiş ve bu alanda doğan ihtiyaçlar neticesinde, okul öncesi eğitim mekanları için 'değerlendirme modeli' kurgulanmıştır.

Eğitim, tasarım, mimarlık ve yapısal çevre çalışmalarına göre kurgulanmış ve hazırlanmış olan bu tez, asal düşünce (tema) analiz (theme analysis), yapılandırma amacı ile literatür taraması (structured review) and taksonomi analizi (taxonomy analysis) yaklaşımları ile metodoloji (yöntembilim) kurgulanmıştır. Yapılan çalışmalar ışığında tez üç ana aşama içermektedir. Bu aşamalarda, okul öncesi mekanlarda 'Quality without a Name' / 'İsmlendirilemez Kalite'yi tanımlayan göstergeçler belirlenmiş; okul öncesi mekanlarda gerekli olan tasarım kalitesi tanımlanmış ve önerilen model oluşturulmuştur. Birinci aşamadaki araştırma amacı, 'İsmlendirilemez Kalite'nin göstergeçleri, okul öncesi mekanlar için gereksinimleri tanımlamak olmuştur. Bu aşamadaki bulgular, iç mekan tasarımı ile ilgili konuları tanımlamıştır. Bu bulgular ışığında eğitim, çocukların gelişimi - öğrenimi, öğretmenlerin performansı ve ebeveyin katılımı konuları 'İsmlendirilemez Kalite'nin

göstergeçleri olarak tanımlanmış, aynı zamanda ‘çocuk gelişimine dayalı deneyimler’ ve ‘bütüncül deneyimler’ okul öncesi mekanlarda devamlı yapılan eğitim deneyimleri olarak ortaya konmuştur. İkinci aşamada, okul öncesi eğitim yapılarının iç mekan tasarımı, ‘İsmlendirilemez Kalite’nin göstergeçleri göz önünde bulundurularak tartışılmıştır. Bu aşamada oluşturulan kurgu, önerilen modelin teorik alt yapısını oluşturmuştur. Son aşama olan üçüncü kısımda ise, bir önceki aşamada oluşturulmuş olan teori yardımı ile alt dallar kurgulanmış ve modelin değerlendirme stürüktürü yapılandırılmıştır. Daha sonra ise, her değerlendirme maddesi için kullanılması gereken değerlendirme teknikleri oluşturulmuş ve modelin son çerçevesi şekillendirilmiştir.

Modelin şekillendirilmesi için oluşturulan söz konusu sistematik yaklaşım, okul öncesi eğitim yapılarının iç mekan tasarımlarının yanı sıra, farklı eğitim yapıları için tasarım değerlendirme modeli oluşturulması amacı ile de kullanılıp, değerlendirme modeli ile elde edilen bulgular yeni teorilere ışık tutabilme olanağı sağlamaktadır. Çalışmanın sonucunda oluşturulan model kullanılarak, farklı okul öncesi eğitim yapılarının iç mekan tasarımına ait değerlendirmeler de yapılıp modelin dinamik özelliğe sahip yapısı ile devinimi sağlanarak yenilenebilir. Bu tezde oluşturulmuş teorik kurgu, iç mekan tasarım alanı ile okul öncesi eğitimi buluşturarak disiplinler arası bilgi birikimi ve birlikteliği sistematik bir şekilde ortaya koymaktadır. Oluşturulan disiplinler arası söz konusu teorik kurgu,disiplinler arası farkındalığın oluşmasında tasarımcılara ve eğitimcilere katkı sağlamakta, aynı zamanda modeli kullanmak için de yardımcı olmaktadır.

**Anahtar Kelimeler:** Okulöncesi Binalar, Eğitim Mekanların Kalitesi, Çocuk Alanraın Çevre Tasarımı ve Düzenlemesi, Çocukların Öğrenme Süreci, Günlük Eğitim Deneyimleri.

**To all the Children,**

The most **Innocent** and **Valuable** members of our societies…

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# INTRODUCTION

## 1.1 Background of the Research

In 21st century there is an increase in designers concern about integrating the requirements of students' effective learning in designing the learning spaces. Newly build schools and educational institutions have been transformed from housing the education environment to places that support and lead the education. New developments and findings indicate the importance of understanding the learners, teachers and the curriculums in designing educational spaces in providing quality and effective learning (Savin-Baden, 2007).

With increase in attendance percentage of young children in educational settings the quality of early childhood learning spaces has become a challenging subject in societies. Previous researches claim about the effect of the designate environment on children's developmental behavior and proved that increase in quality of architecture increases the quality of early childhood education (Rivlin and Wolfe, 1985, Moore, 2001). Due to these findings design and arrangement of early childhood educational spaces has been defined as one of the main indicator of quality learning in many assessments and studies.

Regardless of the necessity of generating theories about linking the attributes of design in spaces to different disciplines for improving the quality of life within the

interiors (Taylor & Preston, 2006), there are limited analysis models and evaluation frameworks that allow establishing theories on the results of cooperation between educationalists and interior designers in increasing the quality of educational spaces.

Existing rating scales and assessments such as 'The Early Childhood Environment Rating Scale-Revised', 'Preschool Learning Environment Checklist' and 'Children's Physical Environments Rating Scale' are the examples of tools that include the design and arrangement of spaces in relation to basic requirements of the preschool education. Being involved with the actual life of early childhood settings would make the conducted results and studies extremely valid since children, especially in the early years, need to be studied in their own context and environment (Longston, Abbott, Lewis & Kellett, 2004).What has been missing in framework of these tools is lack of a system that evaluates the quality of design and arrangement of spaces in relation to the everyday learning experiences of the context. Due to this inadequacy the actual life that happens inside the spaces and the requirements of everyday learning experiences has remained unnoticed.

Since relationship of attributes of early childhood environmental quality such as users' interaction, program and children's development with the design of spaces are not easily measurable and hard to observe, (Gunn, Fuligni & Berlin, 2003). However the concept of 'quality without a name' that has been introduced by Christopher Alexander in 1977 proved that adjusting the patterns of everyday experiences with the architectural patterns is an easy task when the common paths of experiences in spaces are predefined (Alexander, Ishikawa & Silverstein, 1977).

Current study discusses that by identifying the common patterns of preschool learning experiences and defining the quality indicators that influence these experiences, it is possible to propose a framework that evaluates the quality of design and arrangement of spaces in relation to everyday learning experiences in the setting. The theory established in this thesis aims to create a new perspective on the concept of design quality in educational spaces and proposes a model that would allow inspectors to evaluate the quality of preschool spaces according to the way their design and arrangement responds to the requirements of everyday learning experiences.

Although current study focuses on interior space of preschool settings, the systematic process of shaping the evaluation model can be adopted for controlling the design quality of learning spaces in other stages of education where the aim is evaluating the quality of design in relation to the everyday learning spaces. These types of evaluation frameworks would allow designers to be aware of the positive or negative influence of their design solutions on the actions of inhabitants and the quality of learning environment after occupancy of the spaces.

## 1.2 Statement of Research Problem

Review of on the literature on attempts and perspectives towards improving the quality of educational spaces determines that design configuration of contemporary educational spaces requires understanding the requirements of learning environment and design the spaces by intention of enhancing these requirements (Gifford's, 2002, Design Council, 2005, Boys, 2010, Hill, 2011 & Royal Institute of British Architects in Frearson, 2012). To arrange the patterns of design in educational spaces parallel with the patterns of learning experiences designers need to understand the aspects of

these learning experiences (Shusterman, 1997 & White, 1998, Poldma, 2010). This challenge is in line with the concept of ‘quality without a name’ that has been introduces by Christopher alexander in 1970 and claims of configuration of the language of design in spaces based on the patterns of everyday experiences.

Investigation of the surveys and studies that deal with improving the design quality of educational spaces established that amount of theory that discus the quality of design in learning spaces term the perspective that has been introduced by Christopher alexander is very limited. There are two studies that follow the alexander’s perspective and discus the design of educational spaces in terms of aspects of learning environment which one look at the learning environment in general () and the other one discus the overall life of an early childhood classroom (). This gap of theory established the need for generating more theory in terms of preschool spaces, since preschool age is the age that learning happens through experiencing and interaction.

CCERS-R, FCCERS-R, Early Childhood Environmental Education Rating Scale, Preschool Environment Checklist, Checklist for Essential Environmental Items for Preschool and in the latest attempt Children’s Physical Environment Rating Scale (CPERS) by Moore, Sugiyama and Donnell (2003) are existing assessment tools that focus or include the items that deal with improving the design quality of preschool spaces. In the framework of these tools educational spaces are considered as still and static entities and existing dependencies of the learning environment has been avoided, therefore theories that are generated by using these tools are failed to fill the current gap.

Based on the need for generating theories on the transactional relationship between the design of spaces and attributes of learning experiences in preschool settings the research question of this study is identified as follow:

‘How to evaluate the quality of design and arrangement of interior spaces of preschool setting in respond to the necessary requirements of the everyday learning experiences and establish a report that describe the strengths and weaknesses of design in relation to these requirements?’

## 1.3 Statement of Purpose

This study aims to shape a new perspective on the definition of design quality in interior spaces of educational settings by interpretation the relationships between preschool spaces, occupants and patterns of everyday learning experiences. The main intention of this research is to shape an evaluation framework that allow tracking the strengths and weaknesses of design solutions in spaces in respond to the aspects of preschool learning environment.

Reviewing the criticism on the problems with the existing preschool spaces assessment tools clarified four mini problems these problems are as follow:

1. Current assessment tools are not contextually sensitive and do not consider the divers goal of early childhood education and as a results their results are not reliable and meaningful in terms of design (A Guide to Assessment in Early Childhood, 2008).

2. Current assessment tools do not consider staff, children and education in evaluating the design of spaces (Lee & Walsh, 2004).

3. Current assessment tools do not include methods that guide inspectors to evaluate the design and arrangement of spaces in relation the everyday learning experiences (La Paro, Pianta & Stuhlman, 2004).

4. Current assessment tools do not allow inspectors to include the visual presentation of their results (Harms, Jacobs & White, 1996), while visual materials are universal language between the designers and play an important role in presenting the actual situations and design solutions.

Based on these problems the model that is purposed in current study aims to:

1. Shape an evaluation framework that is contextually sensitive and considers the divers goal of early childhood education.

2. Consider staff, children and education in evaluating the design of spaces.

3. Include methods that guide inspectors to evaluate the design and arrangement of spaces in relation the everyday learning experiences.

4. Encourage inspectors to include the visual presentation of their results.

## 1.4 Assumptions and Limitations

This study focuses on the educational spaces as the scope of research and since age plays an important role in differentiating the educational patterns current study focus on preschool age and establish the investigation in the light of preschool educational program and disciplines. This study avoids the regional variables and does not include culture, economy and governmental rules in the scope of research since the aim is to establish a universal evaluation framework and in this thesis it was assumed that preschool settings obey the standard learning curriculum that have been suggested by most of the early childhood quality resources.

The purposed evaluation model does not include safety, ergonomic and accessibility items in its framework and refer to these items where they are necessary for controlling the quality of design in relation to specific patterns of learning experience. Definition of this limitation is due to existence of variety of assessment and standards that focus on subject of safety, ergonomic and accessibility in preschool settings (Lueder & Rice, 2008, National Association for the Education of Young Children, 2015). Consistent with this limitation it is suggested to apply the current model after the preschool spaces are occupied and assessed in terms of safety, ergonomic and accessibility standards.

## 1.5 Methodology

Meta-analysis on the literature indicated that the domain of data related with design quality in preschool spaces is fulfilling for extracting data and shape the intended evaluation model and therefore to conduct this study, literature survey has been selected as the research methodology. There are also three other reasons behind selecting literature survey as the research methodology (Bless, Smith, & Kagee, 2006):

1. Improving the theoretical framework related to the subject of design quality in preschool spaces and aim to study the definitions, perspectives and methods used in previous works and shape a new perspective on this subject.

2. Introducing the developments related to the subject of design quality in interior space of preschool setting.

3. Discovering the connections, contradictions and other relations between different disciplines in field of preschool quality and interpret the dependencies of design quality of preschool spaces accordingly.

The review starts by searching the databases and excluding the relevant studies. This process produced books, articles, reports and reviews that their body of knowledge had connection with the focus of study. In selecting the studies, recent studies were put into noticed for citation. The final findings were extracted by considering variety of disciplines that influence the design quality of preschool spaces and their learning environment including, education, psychology, environment, architecture and design. Considering all these disciplines was necessary to learn different perspectives on the same issues and identify the contradictions.

Shaping the framework of 'Quality Analysis Model' included three main stages of research: identifying the indicators of 'Quality without a Name' in preschool spaces, Definition of design quality in preschool spaces and Model proposal. The technique that has been used in each stage is described in detail in following section.

### 1.5.1 Review on Indicators of Quality without a Name in Preschool spaces

In this stage of research the aim was identifying the requirement of evaluating the concept of 'Quality without a Name' by interpretation of Alexander's ideology of this kind of quality in preschool spaces and then investigate the necessary subjects that shape this quality in preschool settings. Data collection in this stage of research is accomplished by using theme analysis. The technique of theme analysis that is used in current study has been inspired the study of James Thomasc and Angela Harden's study 'Methods for the thematic synthesis of qualitative research in systematic reviews' (1993) and accomplished through six steps:

**1. Defining the Scope of Investigation:** Subjects that shape the central quality in preschool settings.

**2. Selecting the Resources**: The selection was confirmed if the content of the resource would indicate data related to the scope of investigation. The resources mainly selected from the scientific journals articles, books and reports.

**3. Expanding the Resources:** the resource selection has been expanded by investigating the references of selected resources and adding the relevant resources that were not already considered to the chunk of resources.

**4. Quality Assessment of the Resources:** During this step the reliability of the resource was evaluated.

**5. Line by Line Coding:** Any data that would answer the scope of investigation was extracted and coded.

**6. Grouping the Extracted Codes:** The extracted codes were grouped according to the similarities they share. Final groups were identified as the subjects that shape the central quality in preschool spaces.

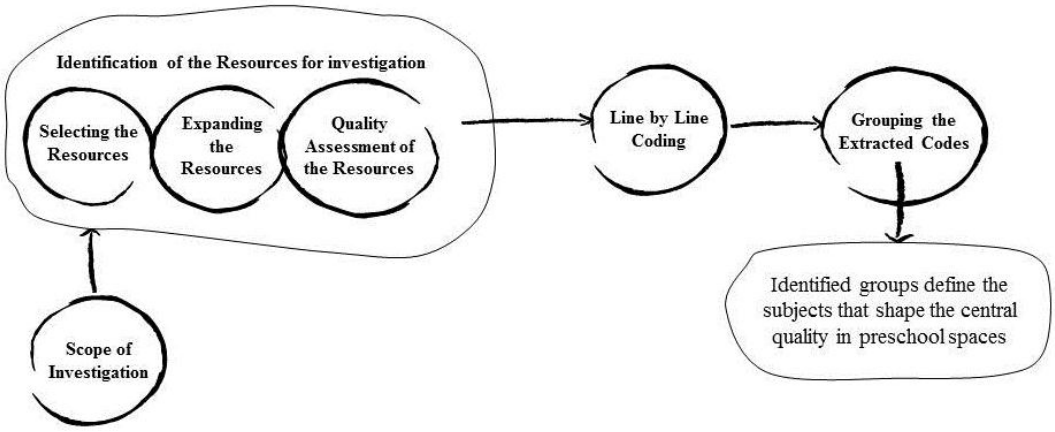


Figure 1. Schematic presentation of theme analysis in first stage of research

### 1.5.2 Review on Design Quality in Preschool Spaces

In this stage of research first surveys on improving the design quality of preschool spaces has been investigated and classified by using structured review and then the design and arrangement of preschool spaces is discussed in relation to the subjects

that define central quality in these spaces. To generate the theory that interprets the design and arrangement of spaces in relation to the central quality of preschools, qualitative content analysis and sense making has been used as the techniques to review the literature.

Shaping the theory in this stage include two phases. First phase is extracting the data on design requirements of preschool spaces that are necessary for enhancing the requirement of central quality and the data collection in this phase is accomplished by using qualitative content analysis. The step by step investigation of this phase was inspired by studies established by Mayring (2002) and Hsieh & Shannon (2005). Qualitative content analysis included five steps:

**1.** Defining the subject of investigation: The necessary Design Considerations for enhancing the requirements of central quality in preschool spaces.

**2. Develop Categories**: Common learning experiences that keep happening in a preschool setting define the categories and the necessary patterns of activities during each of these learning experiences shape the scope of investigation for each category.

**3. Coding Unit:** The necessary skills that preschoolers need to develop in each learning experiences define the units of analysis.

**4. Preparing the Data:** The selection of the data was accomplished by using rich bibliographic databases including Google Books, Google Scholars, SUMMON and EBSCO and documents relevant to each scope of investigation selected and located under the relevant categories.

**5. Theme Extraction and Coding the Data:** Data collection conducted by using step by step model. This means that the themes were extracted purposively, by considering the support design and arrangement of spaces need to provide for supporting the patterns of activities (scope of investigation) in the light of skills

preschooler need to develop (units of analysis) during each learning experiences (categories). The extracted design requirements were coded based on their relevant categories.

In second phase of investigation in this stage the extracted data were structured to shape a theory that indicates the necessary supports by design and arrangement of preschool spaces for enhancing the activities during every day learning experiences. In this phase to shape the theory, sense making has been adopted as the methodology and the steps for accomplishing the sense making is inspired by Bradley's approach (1993). The sense making is accomplished through four steps:

**1.** Dimensions of the classified data were explored.

**2.** Relationships between the groups of data were identified.

**3.** Inferences and meanings were derived out of the data.

**4.** New theory was reconstructed.

At the end of this phase for each learning experience a theory that indicate the transactional relationship between the design of spaces, occupants and patterns of learning activities was restructured.

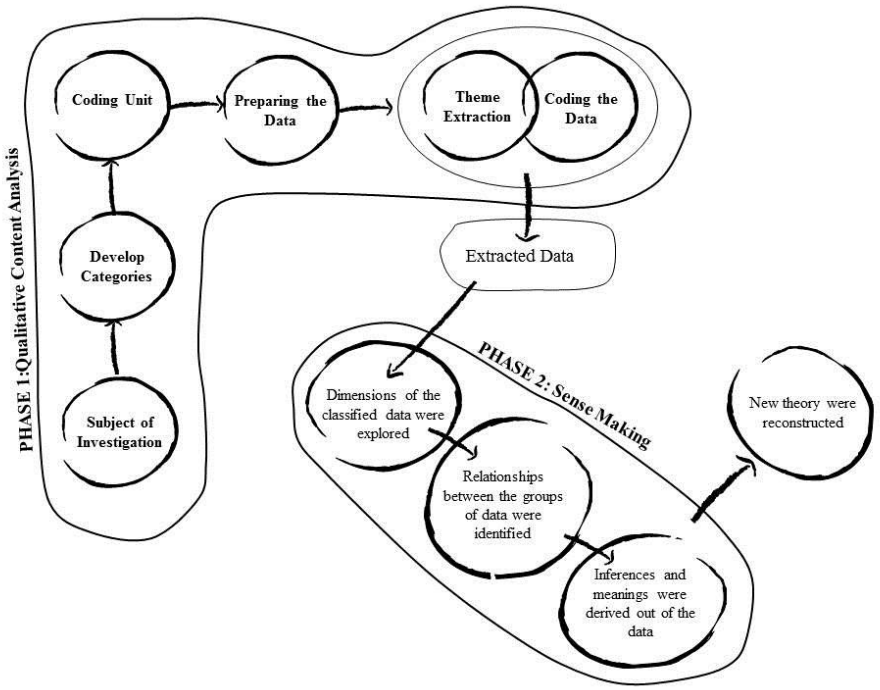


Figure 2. Schematic presentation of Methodologies in Second stage of research

### 1.5.3 Model Proposal

This stage of research consists of two phases. In first phase the aim was classification of the theory that describe the necessary design and arrangement of preschool spaces in relation to the requirements of central quality during each learning experiences (section 1.5.2) into evaluation criteria and items that would shape the framework of quality evaluation model. To accomplish this phase, taxonomy analysis has been adopted as the research methodology and the scope of taxonomy is identified as follow:

**1. Evaluation Criteria (Initial Theme/Concern):** Main design criteria that is necessary for enhancing patterns of activities during each learning experience.

**2. Indicators:** The necessary design requirements of each design criteria that would enrich that design criteria in relation to the patterns of activities it need to support.

**3. Items of Evaluation:** The necessary design characteristics that should be seek in spaces in order to respond to design requirements of each design criteria.

The result of taxonomy analysis of the structured theory shape the framework of the evaluation model and define the considerations inspector need to follow in evaluating the design quality of spaces in terms of requirements of learning experiences. In second phase of this stage, the evaluation techniques that inspectors need to use for evaluating the items were defined and structured based on each item's scope of evaluation. For investigating the appropriate method of evaluation to be included in the model, systematic review were adopted as research methodology. After locating the evaluation methods for each item, the final framework of the design quality evaluation model for preschools was established.

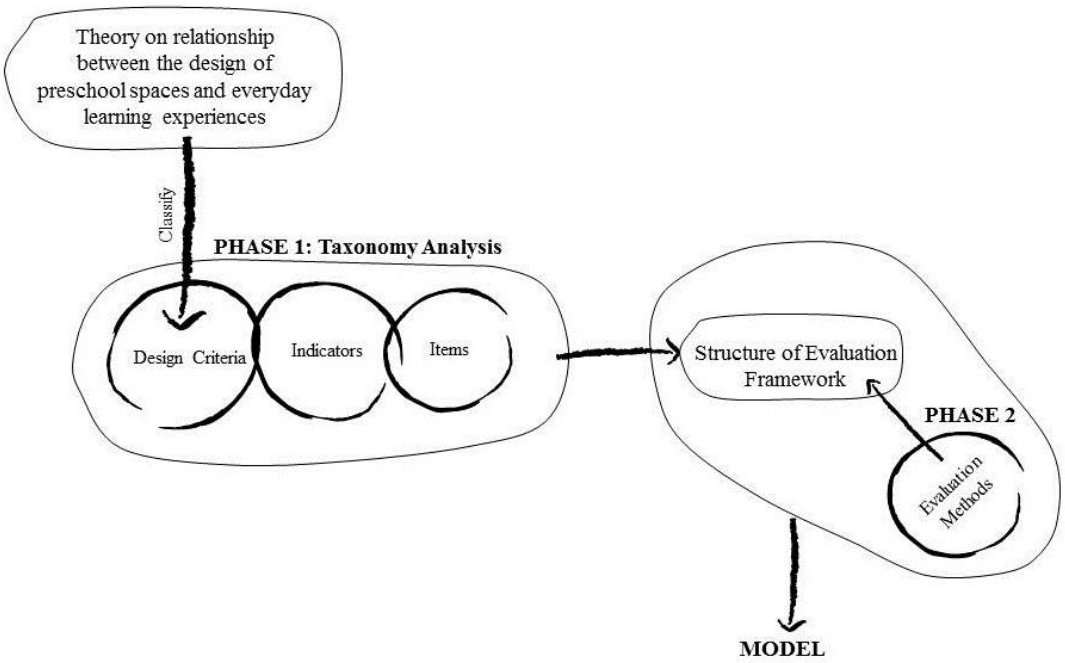


Figure 3. Schematic presentation of Methodologies in third stage of research

## 1.6 Significance of the Research

This study will be a significant attempt in promoting an evaluation method with the intention of improving the quality of design and arrangement of interior space of preschool settings based on the requirement of everyday learning activities. Moreover, the step by step instruction of shaping the evaluation model will also be

beneficial for learning spaces in other stages of education and put an emphasize on shaping quality evaluation models that includes the design requirements of the learning environment.

This study also links the findings from the variety of disciplines that deal with improving the quality of preschool education with the findings of interior designers and architects and in this way establish a theoretical bridge that describes the quality of spaces by referring to the different attributes of children's quality learning. And more importantly the report that would be generated by using the proposed quality evaluation model will be a review on the level of coordination between the interior design, educational inputs and users' requirements and identify the gaps and strengths for further improvements.

# Chapter 2

# QUALITY WITHOUT A NAME IN PRESCHOOL SETTINGS

This study is established in parallel with the need for the type of interior design quality that responds to everyday learning experiences in contemporary educational settings. In parallel with defining the quality that would answer this need, Volker (2010, p.17) defines a holistic perspective about the quality of design and states that "design quality need to be seen as the achievement of an integrated totality that is more than a sum of the parts". He refers to everyday usage "features, properties, traits, characteristics, attributes" as the "substitutes of qualities and values of design".

Volker's definition of design quality is in continue with what Vitruvius introduces as utility and Prasad describes as functionality. Vitruvius describes that utility can be achieved when organization of spaces is correct in relation to the use and requirements (Thompson & Blossom, 2015) and Prasad (2004) claims that functionality is concerned with how the design is supporting the function and how appropriate the design is for what it is supposed to do. This is the quality that it is necessary to be evaluated in interior spaces of educational spaces. This type of evaluation will clarify utility or in other words functionality of interior design of spaces towards the attributes of usage during learning experiences.

Quality without a name that has been introduced by Christopher alexander is the type of quality that is the result of considering the patterns that keep happening in spaces

and achieving this quality by designers in preschool spaces would improve the utility and functionality of interior design in these spaces in relation to their use and requirements. To get an overview on requirements of shaping a model that would allow the inspectors to evaluate quality without a name in preschool settings, it is necessary to have a deeper understanding about the necessary requirements for shaping this type of quality in preschool spaces.

Christopher Alexander (1979) in his book 'The Timeless Way of Building' states that there is a central quality that is the reason for creation the spirit of buildings and creating a quality without a name in spaces. According to his discussions this central quality is shaped by persons in the moments and situations. He suggests that to search for central quality it is necessary to understand the patterns that keep happening in spaces. Consistent with Alexander's statement, to achieve the quality without a name in preschool spaces it is necessary to understand the patterns of learning experiences that keep happening in preschool spaces and indicators that shape these experiences (figure 4). Following section of this chapter discuss the learning experiences that keep happening in spaces and subjects that shape these learning experiences and identify the requirements of central quality accordingly.

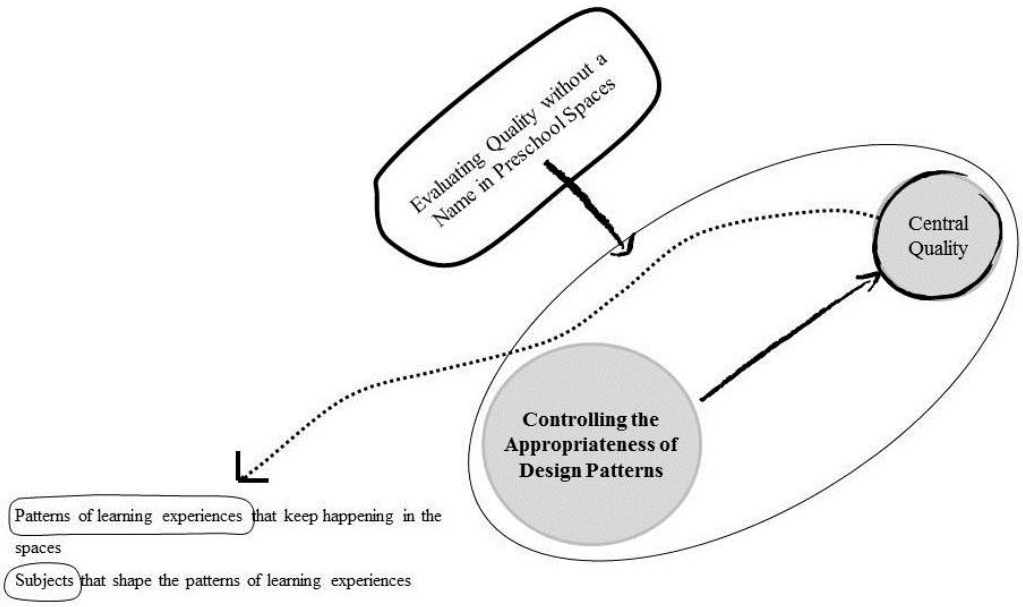


Figure 4. Requirements of evaluating 'quality without a name' in preschool settings (Inspired by Christopher Alexander's definition of quality, 1970)

## 2.1 Common Path of Learning Experiences in Preschool Settings

In this section, communal path of learning experiences in everyday life of a quality preschool will be identified. This identification will clarify the patterns of activities that keep happening in preschool spaces. Reviewing the global efforts in establishing preschool curriculum manual by intention of offering a quality preschool education classifies three sets of resources that instantly deal with improving the preschool education quality:

**1. Nations/Countries**: Countries improve and develop their rules and regulation to improve the quality of preschool education they offer.

**2. Preschool Educational Approaches**: Various types of preschool education are structured for offering a quality education during preschool age and these approaches keep their strategies and disciplines up-to-date by establishing long and short term researches.

**3. Preschool Quality Assessment Tools**: Specific assessment tools are developed to improve the quality of preschool education and enrich learning experiences.

To define a communal path of learning experiences and identify the patterns of learning activities that is expected to keep happening in preschool settings the leading resources in sources that are identified above have been investigated and classified. After classifying the leading resources in improving or offering quality preschool education, learning experiences that have been included in the curriculum or framework of these resources have been investigated and classified. By this classification, similar learning experiences that have been suggested by most of these resources were selected and shaped the communal path of learning experiences that is expected to happen in a quality preschool.

Classification of the learning experiences that are included in the framework of selected resources is accomplished according to their contribution to preschoolers' learning. These contributions were mainly to children's main area of developments, their adaptation to the routine and culture of the setting and their development of specific skills and behavior. Learning experiences that improve children's main areas of development have classified as '*developmental-based learning experiences'*. Learning experiences that help children to adopt the sittings' routine are classified as '*holistic learning experiences*'. These experiences were named as holistic since they help children improve variety of skills in relation to their life and personal self. And finally learning experiences that focus on children's specific skill and behavior were classified as '*multi-dimensional learning experiences*' since they don't happen through variety of activities.

Investigating the curriculum of leading countries in providing preschool quality education identified that most of these countries emphasize the learning experiences such as literacy, mathematics, science, play, motor activities and art that supports

preschoolers' development. Findings also claims that these countries consider teaching children about ethics, health and culture as the holistic learning experiences that need to be improved throughout the settings' routine. These curriculums consider multi-dimensional experiences as the patterns that would enhance children's developmental based and holistic learning experiences (table 1).

Investigation of educational approaches curriculum indicates that same areas of developmental based and multi-dimensional learni9ng experiences that were emphasized by countries curriculum are considered for a providing quality preschool education, however these approaches put more emphasize on improving children's understanding of ethics, culture and health through greetings during arrival and departure (Table 2).

Investigating the preschool education assessment frameworks also support the areas of developmental based learning experiences that are established by countries and preschool educational approaches and put an emphasis on teaching children about health, hygiene, Well-being and socialization.

Table 1. Learning experiences suggested by 10 leading countries in providing quality preschool education (LIEN Foundation, 2012)

| **Nations** | **Developmental-Based Learnıng Experiences** | **Holistic Learning Experiences** | **Multi-Dimensional Learning Experiences** |
|---|---|---|---|
| Finland<br>(Core Curriculum for PreSchool Education, 2010) | Language \| Mathematics \| Environmental and Natural Studies<br>Physical and Motor Development \| Arts | Ethics \| Health \| Culture | Interaction \| Religion |
| Sweden<br>(Preschool Lpfö 98, 2011) | Literacy \| Mathematics \| Play<br>Science and Nature \| Motor and Physical Development | Ethics \| Health \| Culture | Curiosity \| Dance \| Drama \| Music<br>Explore \| Create and Build \| Technology |
| UK<br>(UK Department of Education, 2014) | Literacy \| Mathematics \| Science<br>Physical Development \| Art and Design | Personalization | Socialization \| Emotion |
| Norway<br>(Ministry of Education and Research, 2014) | Literacy \| Mathematics \| Science<br>Physical Development \| Art | Ethics \| Health \| Culture | Communication \| Religion \| Culture<br>Creativity \| Technology |
| Belgium<br>(OECD, 2000) | Literacy \| Mathematics \| Science<br>Physical Development \| Art | Personalization | Communication \| Creativity |
| New Zealand<br>(Ministry of Education, 2015) | Holistic Development Experiences | Family and Community | Empowerment \| Relationship |
| Netherlands<br>(Broekhof, 2006) | Literacy \| Mathematics \| Play | Eating and Drinking | Creativity |
| Denmark<br>(UNESCO, 2012) | Literacy \| Science<br>Physical Development \| Play based Learning | | Communication \| Creativity \| Cooperation |
| France<br>(OECD, 2004) | Literacy \| Science \| Art | Health and well-being | Emotion \| Exploration \| Imagination |
| South Korea<br>(Ministry of Education and Human Resources, 2007) | Literacy \| Art | Health | Socialization |

Table 2. Learning experiences included in preschool education approaches

| **Educational Approaches** | **Developmental-Based Learnıng Experiences** | | | **Holistic Learning Experiences** | | **Multi-Dimensional Learning Experiences** | | |
|---|---|---|---|---|---|---|---|---|
| Montessorie (URL 1) | Literacy | Mathematics | Art | Practical Life Tasks | Culture | Socialization | | |
| High Scope (HighScope Educational Research Foundation, n.d.) | Literacy | Mathematics | Science | Health | Greeting | Communication technology emotion | | |
| | Physical Development | | Art | | | | | |
| The Waldorf Approach (Waldorfcurriculum, 2014) | Science | | Science | Greeting | | Socialization | | |
| | Music and Movement | | Art | | | | | |
| The Bank Street Approach (Ershler, 2013) | Literacy | | Mathematics | Greeting | | Socialization | | Emotion |
| | Science | | Art | | | Confidence | | Self-esteem |
| Reggio Emilia (Fraser & Gestwicki, 2002) | Experimental and Flexible Learning | | | Greeting | | Communication | Relationship | Collaboration |
| Creative Curriculum (Johnson, 2012) | Literacy | Mathematics | Art | Greeting | Family and Society | Socialization | | Technology |
| | Music and Movement | Motor Development | Dramatic Play and Blocks | | | | | |

Table 3. Learning experiences included in preschool education quality assessment tools

| **Quality Assessment Tools** | **Developmental-Based Learnıng Experiences** | | | **Holistic Learning Experiences** | **Multi-Dimensional Learning Experiences** | |
|---|---|---|---|---|---|---|
| Preschool Learning Environment Checklist (Preschool Environment Checklist, n.d.) | Literacy | Mathematics | Science | Health and Hygiene | Technology | |
| | Blocks and Dramatic Play | Motor Development | Art | | | |
| Scottish Office Education and Industry Department (Scott, 2001) | Literacy | | Mathematics | Personalization | Emotion Socialization | Technology |
| | Science | | Physical Development | | | |
| Early Childhood Curriculum, Assessment and Program Evaluation framework (NAECS/SDE, 2003) | Literacy | Mathematics | Science | Health and well-being | Emotion | Interaction |
| | Performing art | | Art | | Socialization | Exploration |

As the result of investigation of learning experiences that are recommended by leading resources in providing a quality preschool education, identified learning experiences that were recommended by these resources as '*developmental-based'* and '*holistic*' learning experiences were extracted and shaped the communal path of learning experiences.

Since '*multi-dimensional*' learning experiences include improvement of specific skills and behavior that would be develop during both developmental based and holistic learning experiences, are not included in the communal path of the learning experiences and they are considered as the inputs for further investigation to shape a model. The final classification is as follow (figure 5):

**1. Developmental-Based Learning Experience:** These experiences focus on supporting stages of preschoolers' development (Literacy, Mathematics, Science, Play-based learning experiences, Motor-based learning experiences and Art).

**2. Holistic Learning Experience:** Experiences such as greeting, stay hygiene and healthy, adopt the culture of eating and drinking are mainly shape these group of experiences. To identify the subsets of this group, initial experiences that offer activities that would enhance these skills and behavior were identified as transit that serves greeting during arrival and departure, cooking and dining that allow children help children learn about health nutrition and improving their ethics, well-being and culture of eating and toilet training (lavatory) which children learn about importance of hygiene and staying healthy.

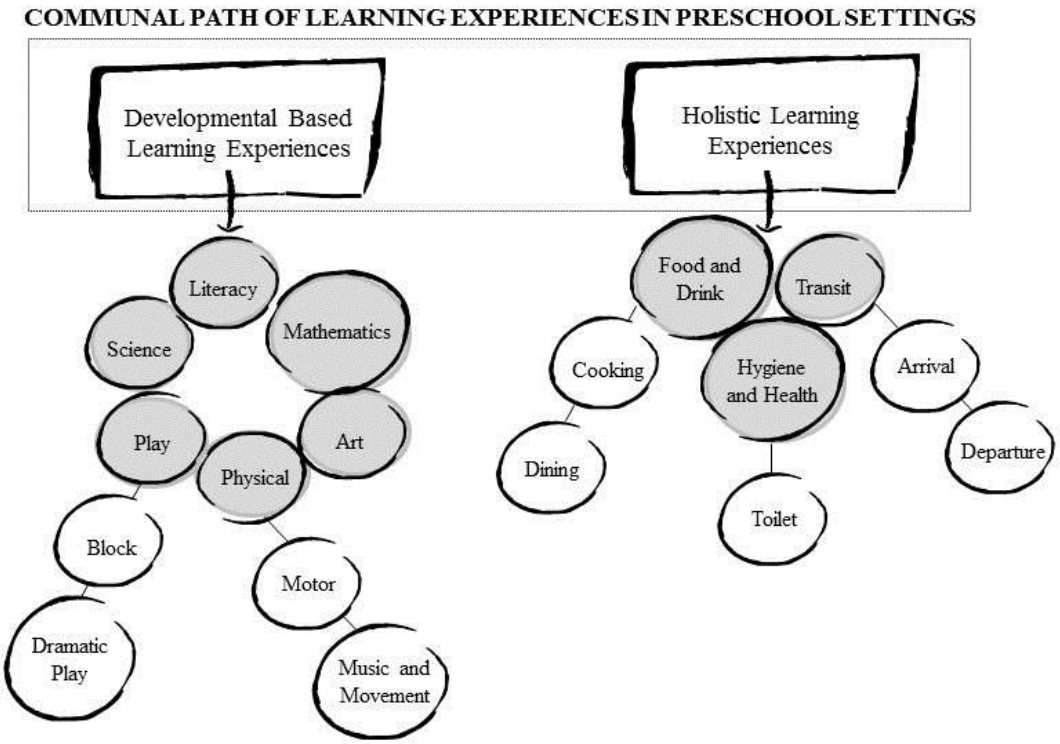


Figure 5. Communal path of learning experiences in preschool settings according to the leading resources in providing quality preschool education

## 2.2 Indicators of Learning Experiences in Preschool Settings

In this section subjects that shape learning experiences in preschool settings will be identified and the transactional relationship between learning environment and design of preschool spaces will be discussed in the light of these subjects. These subjects in fact are indicators of central quality in preschool settings since they have a direct influence in shaping the learning experiences that keep happening in preschool spaces.

### 2.2.1 Educational Program

Behind every learning experience in a preschool setting are specific educational strategies. Educational strategies that are defined by the settings' adopted program will define a routine that be enhanced or rejected by the design and arrangement of preschool spaces. Where design and arrangement of spaces obey the educational-based strategies of learning experiences, the messages that spaces convey to teachers

and children will enhance the philosophy and aim of the educational program and curriculum (Reynolds et al, 2010, Gordon & Browne, 2014). The educational strategies have direct influence on shaping the transactional relationship between designs and learning environment in preschool spaces.

### 2.2.2 Children learning and Developments

The main intention in building a preschool setting is providing a context that would enhance children's development through appropriate learning experiences and therefore children's ability to learn and develop their skills is another important subject that shapes the learning experiences. Researches claim that preschoolers learn and improve their skills through interaction with the physical world (Feinberg, Kuchner& Feldman, 1998, Price & Gwin, 2007) and due to this the instant interaction of children during learning experiences have an influence on shaping the transactional relationship between learning environment and design of preschool settings.

### 2.2.3 Teachers Performance

Teachers are important actors during learning experiences and have an important role on shaping learning experiences through observation, participation and facilitation (Persky & Golubchick, 1991, Ferguson, 2004, Helen, 2011). Teachers' performance during learning experiences is important subject that influence the transactional relationship between the learning environment and design of preschool spaces.

### 2.2.4 Parents Involvement

Parents are the representation of children's identity and they carry children's original background and culture to the environment of the setting. Due to temporary existence of parents in the setting they are considered as subjects that shape the learning experiences where they are involved during the learning activities. However parents

have temporary participation in learning environment but their influence on shaping the transactional relationship between the design of preschool spaces and learning environment cannot be neglected.

Based on discussions in this section, educational program of the setting, children's learning and development, teachers' performance and parents' involvement are four main subjects that shape the learning experiences and are main indicators of central quality in preschool settings (figure 6).

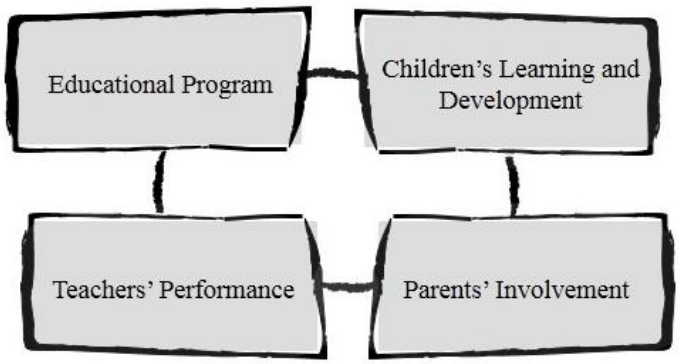


Figure 6. Subjects that shape the learning experiences in preschool settings

## 2.3 Central Quality and Its Requirements in Preschool Settings

As it has been discussed in beginning of this chapter, interpretation of Alexander's definition of central quality in terms of learning environment of preschool setting indicates that central quality in preschool settings is defined by subjects that shape the learning experiences that keep happening in spaces. Results from investigating the central quality is shaped by *developmental based* and *holistic* learning experiences and *educational program*, *children's learning and development*, *teachers' performance* and *parents' involvement* as the indicator of this central

quality. The indicators of central quality have a direct influence on transactional relationship between central quality and design of preschool spaces (figure 7).

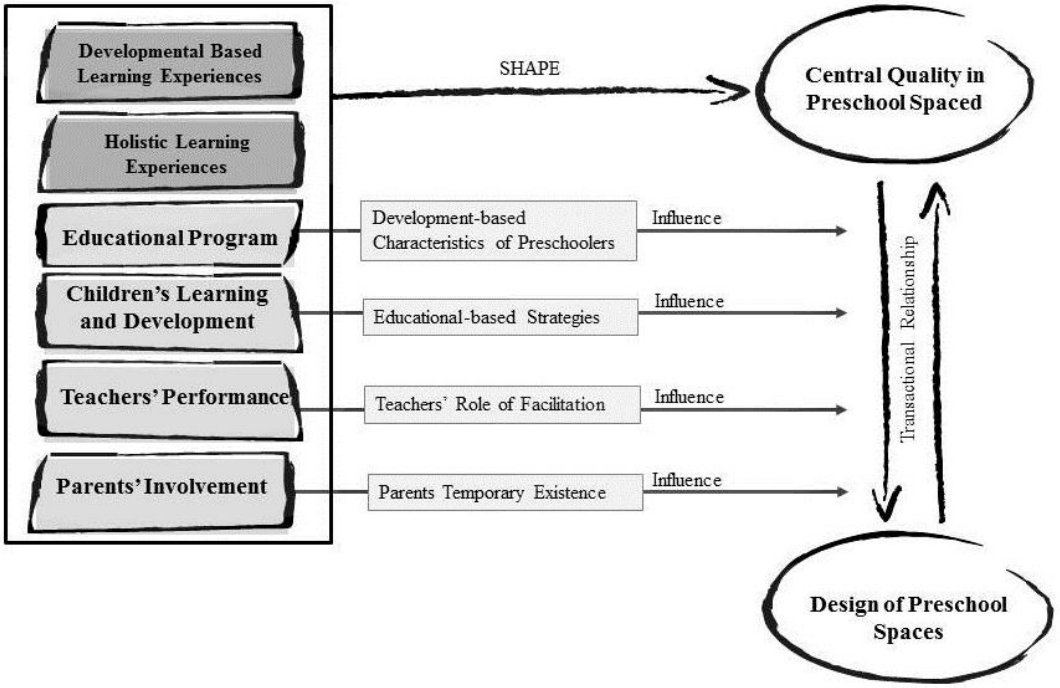


Figure 7. Schematic presentation of transactional relationship between central quality and design of spaces in preschool settings

Requirements of subjects that shape the learning experiences during each learning experience identified the requirements of central in preschool settings. These requirements identify the patterns that design and arrangement of spaces need to support in order to enhance the central quality and achieve the quality without a name. In following sections the requirements of children's learning, teachers' positive performance and parents' involvement are investigated in the light of educational strategies during each learning experiences and requirements of central quality are identified accordingly.

### 2.3.1 Requirements of Central Quality Indicators during Developmental-Based Learning Experiences

Children and teachers' requirements for shaping a quality learning experience varies during each learning experience based on the requirements of educational strategies. In following sections patterns that children and teachers need to experiences and accomplish during five categories of developmental based learning experiences will be identified in the light of educational strategies. These patterns is the representation of the requirements of these indicators that design of spaces need to respond to.

#### 2.3.1.1 Literacy-Based Experiences

First developmental learning experience is literacy. In general the literacy-based experiences can be defined as print related and language related patterns of activities (Caspe, 2009). During print related activities children are expected to interact with the materials, explore the items, feel curiosity, participate in solitary and group projects and be involved with technology (Bardige & Segal, 2005, Openshaw & Soler, 2007, Hanna, et al., 2010). During language related patterns of activities, children's are expected to imagine, interact, communication and cooperation and improve their linguistic skills accordingly (Dickinson & Tabors, 2001, Morrow, 2007, Griffith, Beach, Ruan & Dunn, 2008). On the other hand teachers during the literacy-based experiences are expected to take the role as observer, facilitator and participants (Enz & Morrow, 2009, Justice & Vukelich, 2008).

#### 2.3.1.2 Art-Based Experiences

Children's experience of doing rather than producing, experience of interaction, experience of manipulation, experience of expression, experience of individual performance and experience of being creative are the main patterns that help them experience quality art development (Brown & Sax, 1988, Goldhawk, 1998, Libby,

2000, Schwake, 2013, Beaty, Mayskey, 2014). During art experiences teachers are preferred to be observers and only interact where it is necessary (Dixon & Tarr, 1988).

#### 2.3.1.3 Mathematics-Based Experiences

During mathematics children are expected to be involved in self-interested experiences, manipulation and group works. They are also expected to share and communicate about their math experiences and be involved in technology-based (Ginsburg, 2009, Yelland, Butler & Diezmann, 2014, Pecaski, 2015). Math learning mainly happens through interacting with objects and being involve with fascinating games such as dominos, puzzles, shape cubes and etc. (Williams, Cunningham & Lubawy, 2005, Colorado Preschool Program Staff, 2012).

During math oriented activities teachers are facilitators since learning math is a constructive and social process, therefore beside visual observation, teachers need to be involved in children's mathematical activities verbally and physically (Sammon, 2010, Fullan, Luke & West, 2012, Beaty, 2014).

#### 2.3.1.4 Science-Based Experiences

Learning science in preschool is all about observation, exploration, curiosity, experimentation, discussion (Brenneman, Stevenson-Boyd & Frede, 2009) and children generally tend to be involved in individual and small-group exploration (Harper-Whalen & Spiegle-Mariska, 1991, Tsunghui, 2006). During science-based experiences, teachers are required to set up the situations, listen, and challenge and guide children throughout the experiments, support and extend children's science experiments and assess and record achievements (Beaty, 2014).

#### 2.3.1.5 Play-Based Experiences

Children's are required to have comfortable interaction, feel independent and have control over the environment and experience building the structures (Provenzo & Brett, 1983, Nielsen, 2006, Beaty, 2013, V.T., 2013, Harms, Clifford & Cryer, 2015). In terms of teachers their role varies between an observer and a participant (Beauty, 2013).

Dramatic play is a social experience and it mainly happens in groups (Morrow, 2007). This experience mainly includes three main patterns of experience including creating the role play, pretending the role play and shaping situations to respond to (Jacobs & White, 1994). Based on Maria Montessori theory during dramatic play teachers would take role as director who prepares the environment, observer who supervises and records children's play and a demonstrator who teaches children how to work with the materials and leave them to use the materials independently (Clements & Fiorentino, 2004).

#### 2.3.1.6 Motor-Based Experiences

Motor-based experiences can be classified as fine- motor activities and gross-motor activities. Fine motor activities are considered to involve any hands-on activities, so in fact children would support their fine motor skills during most of the other learning experiences such as art, math, blocks, dramatic play and etc. (Smith, 2003). In this respect all the patterns that involve children in hands-on activities can be considered as the patterns that enhance fin-motor learning experience and there is no need to repeat these patterns once more.

Through gross-motor learning experiences children are expected to gain ability in exploring and examining their body and physical environment through motor skills.

In this aspect, motor developments are associated and integral with the physical activities. Development of Gross motor skills for preschoolers is about the process and the final outcome; therefore teachers need to have a full and active observation over children's engagement in gross motor activities in order to assess children's process and achievements (Williams & Monsma, 2006).

### 2.3.2 Requirements of Central Quality Indicators during Holistic Learning Experiences

Holistic learning experiences involve activities that help children and teachers socialize and adopt the routine and culture of the setting and also help children develop their skills and behavior towards living healthy life by staying hygiene and have healthy nutrition. Three main learning experiences that will be discussed in this section will be interpreted in terms of activities and experiences that children, teachers and parents where they are available are expected to be involved with to support children's positive learning and development.

#### 2.3.2.1 Arrival/Departure Based Experiences

Arrival and departure in preschool is the time that children, parents and teachers have the chance to become social and communicate. Patterns of greeting and waiting during arrival and departure can be a good chance for children to develop their skills of socializing and improve their sense of belonging, safety and security. To ease children's separation from their parents and preparing to start their day availability of option and environment that would encourage children to feel joyful and happy will be a positive attempt (Day and Midbjer, 2007). During this time parents and teachers have the chance to exchange information, therefore socialization and therefore greeting and socialization is the two main patterns that they are expected to be involved with (Essa, 2010).

#### 2.3.2.2 Nutrition-Based Experiences

Experiences during the mealtime are very important in terms of teaching children about respect, patience and good manner. Children are preferred to be involved in serving the food, having delightful food and communication with their teachers and peers and after the mealtime is over participate in cleaning up (Center for Ecoliteracy, 2010).

Cooking experiences are multisensory and very enjoyable for preschoolers (Kohl & Potter, 1997, Essa, 2010) and in some settings children are planned to be involved in cooking sessions and food preparation. Engaging children in food preparation activities is fun and supports their social, emotional, physical and cognitive developments. During cooking activities children are expected to participate in preplanned cooking practices and during these practices teachers should have a full vision of all children and they should be able to reach children easily when it is required (Feeney, 1992).

#### 2.3.2.3 Lavatory-Based Experiences

Toilet training is an important development in preschool age (Gretchen, Peacock & Holland, 2003). Children are expected to develop their confidence, their control over their body, support their sense of privacy and practice to stay clean and healthy while they feel relax and comfortable (Zweiback , 2009, Izadpanah & Gunce, 2014) Teachers during the lavatory-based should mainly take the role as supervisor and guide children through the process without direct interactions (Bickle, 2007).

Based on the finding in this section, children and teachers need to experience specific patterns during each learning experiences in the light of preschool education

strategies in order to experience a quality learning environment or in other word in order to shape a quality central quality.

Necessary patterns that would support children, teachers and parents (when they are part environment) to experience a quality learning environment in preschool settings were extracted based on the findings in this section and located under the relevant learning experience. Table 4 shows the required activities and patterns that children, teachers and parents need to be involved with during developmental based and holistic learning experiences. These patterns identify requirements of central quality in space in order to provide the design that would enhance everyday learning experiences.

Table 4. Required patterns of central quality for shaping a quality preschool learning environment

| Learning Experience | Necessary patterns to shape a quality learning experience | | | | | |
|---|---|---|---|---|---|---|
| | Children | | | Teachers | | Parents |
| Literacy | Exploration | Interaction | Curiosity | Observation | | |
| | Solitary Activities | Technology | Cooperation | Facilitation | | |
| | Group Activities | Communication | Imagination | Participation | | |
| Art | Interaction | Manipulation | Expression | Observation | | |
| | Individual Performance | Creativity | | Interaction when Necessary | | |
| Mathematics | Self-Interested | Manipulation | Technology | Observation | | |
| | Object Interaction | Communication | Group Works | Facilitation | | |
| | | | | Participation | | |
| Science | Observation | Experimentation | Discussion | Listen | Record | |
| | Small-Group Exploration | Individual Exploration | Curiosity | Challenge Children | Extend Experiences | |
| Blocks | Comfortable Interaction | Independence | | Observer | | |
| | Control | Building Structure | | Participant | | |
| Dramatic Play | Play in Groups | Creating Role Play | | Observation | directing | |
| | Pretending | Shaping Situations | | demonstration | | |
| Gross Motor | Movement | Physical Activities | | Supervision | | |
| Arrival/Departure | Socialization | Sense of Belonging | | Observation | Socialization | Socialization |
| | Feeling Secure | Feel Joyful | | Greeting | | Greeting/Separation |
| Cooking | Practice Cooking | Communication | | Observation | Participation | |
| Dining | Dine in Comfort | Communication | | Dine | Observation | |
| | Participate in Serving and Cleaning up | | | Communication | | |
| Using Lavatory | Toilet Training | Confidence, Control and privacy | | Supervision | | |

# Chapter 3

# DESIGN QUALITY IN PRESCHOOL SPACES

Today designers came to an understanding that indoor environment includes design elements and vital environment which both are necessary for designing quality spaces (McClure & Bartuska, 2011). This understanding expresses the ever-changing nature of interiors, since interior spaces are not static entities and house dynamic organizations. Spankie (2009 p. 45) defines the dynamic nature of interiors as "spaces to move around and inhabit", Ganoe (1999) describes it as participating unit that is shaped by the interaction of people with the environment and Olsen (2000) defines it as dynamic places of experiences and events.

Based on the mentioned definition of interior spaces, the vital environment of the interior space includes the living organism within the physical content of interiors. The relationship between the living organism and interiors are transactional. This means that interiors support inhabitants and their actions while inhabitants and their actions shape interiors (Dohr & Portillo, 2011).

Democratization of the education in 20th century created a rapid school construction within a limited time. As the result of this rapid construction result the concept of 'one size fit for all' in design approaches and today quality assessments and researches claims of need for design reconfiguration of most of these schools (OECD, 2011).

The rapid construction of the schools with the intention of fulfilling need of societies for more learning spaces keep architects busy with standard aspects of schools that in many cases the interior spatial organization was avoided (Hertzberger, 2008). Due to this avoidance the transactional relationship between the living system of learning spaces and design became transparent. Neglecting the consideration of transactional relationship between the design and living environment in designing educational buildings encourage researchers and design organizations to start establishing studies that emphasize the importance of considering requirements of learning environments in designing the learning spaces and improving the design quality of educational spaces.

In 2005, design council started a campaign called ‘from the inside looking out’ and in this campaign they look at the 100 years of education and question the reason behind the fact that the design and organization of most of the classrooms have not been changed. In the website of this campaign it has been stated that:

> “We have shown that school users - students, teachers and the wider community - can and must be at the heart of the design process so that it produces environments that genuinely meet their needs and support their vision for teaching and learning. We call this approach 'inside out', in contrast to the traditional approach where schools were designed from the 'outside in' by external professionals working to a one-size-fits-all model of education.

In continue with the mentioned campaign, In 2012 UK government banned costly educational buildings and released a guideline that would cut the cost of designs and defined baseline templates that would fit all the educations. In oppose to this restriction, Royal Institute of British Architects has published a report and discussed five main threats that building educational spaces according to a design templates will have for quality of education. According to this report, template educational

spaces will fail the quality teaching, will avoid students' well-being and positive behavior, will ignore the environmental comfort, and will disregard the requirements of disables and will fail to be sustainable and keep their long term value (Frearson, 2012).

Quality of design in interior space is evolved by the aspects of people's experiences within the space during specific time frame (Poldma, 2010) and to understand how design ends functionally and aesthetically, it is essential to understand the everyday experiences of users (Shusterman, 1997 & White, 1998). Gifford's (2002, p. 298) statement about the interaction of education, users and design in schools shape a holistic perspective about the definition of design quality that is required to be provided in todays' educational spaces. He states that:

> The personal characteristics of students (past school experience, attitudes toward learning, age, Gender and personality) interact with physical features of the learning setting (its size, noise level, climate, population density and design) and the social-organizational climate (rules, curriculum, teaching style, progressive or traditional orientation) to produce learning-related attitudes (satisfaction with school, dissatisfaction with classroom, commitment to learning) and behaviors (class participation, attention to learning materials questioning, appropriate or inappropriate activity, persistence, creatively and, of course, learning and performance).

Parallel with Gifford, Scott-Webber (2004, p.6) states that identification of "intended behavior of teachers and students" and design the "spatial organization of the spaces in a way that articulate these behaviors" will improve the quality of design in educational spaces. And in follow Jamieson (2008, p.48 cited in Boys, 2010) believes that the quality of design in educational spaces can be improved if the design of spaces respond to the "organizational outcomes" which mainly includes

“capacity of growth, modification and adaptation and effectiveness of facility in achieving teaching and learning outcomes”.

All these statements indicate that design quality in educational spaces appears where the design and arrangement of spaces meet the living system of educational life of the settings and as it has been discussed in previous chapter, this educational life shapes a central quality. So the design quality is appears where it meet the central quality of educational settings.

Variation of educational understanding and philosophies among the countries is the main reason that makes the evaluation of transactional relationship between the design of educational spaces and central quality of these spaces difficult (Alexander, 2000). However previous researches emphasize that regardless of variety of users’ perspective, types of educations and design and layout of the schools there are always certain similarities and common issues (Maxwell, 2000; Douglas & Gifford, 2001). Focusing on specific stage of education and defining the common learning experiences and events during that specific stage of learning can simplify the evaluation of design quality of educational spaces against the requirement of their central quality.

In case of preschool education, the design quality is even more significant since most of the studies claim of the influences of designate environment on children’s developmental behavior and address that increase in quality of architecture increases the quality of preschool education (Moore, 2001). Consistent with the important role of environment in supporting the child’s development, there is a huge amount of concern towards improving the architectural spaces of early childhood education

(Zane, 2015). Variety of studies is established with the intention of increasing the design quality of preschool settings and in following section, the perspective and contribution of these researches will be compared with the requirements the quality that has been discussed in this section. quality that  compare the type of quality that has been discussed in this section and scope of quality that has been considered by these studies, in following section the streams of these is classified and their similarity and contradiction with the 'quality without a name' has been discussed.

## 3.2 Surveys Related with Design Quality in Preschool Spaces

In this section researches that have a contribution to improving the quality early childhood educational and in specific preschool spaces are classified and interpreted. The discussions indicate the similarity and contradiction of the results and findings in these studies with the requirements of a design quality that would respond to the preschool learning environment's central quality.

### 3.2.1 Case-Study Based Surveys

This stream of researches has mainly focused on analyzing and investigating the design features in successful designs and their findings indicates deign suggestions that will improve the design quality of spaces. One of the pioneer researchers in this stream is Mark Dudek. Dudek (2000) in his book, 'Kindergarten Architecture' has done an extensive research on the best kindergarten designs and discussed the concept of design quality in spaces in the light of specific architectural criteria. Although his approaches are mainly architectural oriented, but he time to time in his analysis he refers to educational philosophy of the settings or certain requirements of children and learning process through interpreting the design of selected cases.

In another similar approach, Carles Broto (2006) established an in-deep analysis of 26 preschools from all around the world and has surveyed the influence of the physical environment on the behavior of children and points at qualities such as safety, creating calming environment, stimulation of children's interest for increasing the quality of preschool spaces from children's perspective.

Anita Rui Olds (2000) in her book 'Child Care Design Guide' discusses the design requirements for design and layouts of the childcares by referring to her 25 years of design with children and establishes standards and checklists for providing quality early childhood spaces. In her approach she defines light, sound, color, textures, fixtures and furniture as important ingredients of good design.

Parallel with the authors above other researchers such as Gunter Beltzig (2001), Arian Mostaedi (2006), Ji-seong Jeong (2008) and Jure Kotnik (2011) also look at different cases all around the world and discuss their architectural design quality and suggest solutions and features that would make these cases successful examples in terms of children's education.

In comparing the findings and outcomes of these approaches in relation to the type of quality that is emphasized in this research, these studies lack the of interpretation of the actual life of the selected cases and their theoretical framework do not reflect the transactional relationship between the architectural qualities of spaces and everyday learning that happens in spaces.

### 3.2.2 Participatory Design Surveys

In another stream of researches, the intention of improving the quality of design and arrangement of spaces in preschool settings mainly put emphasizes on consultancy with children and teachers and using their idea in design process. In line with improving the quality of early childhood space, designers and educationalists come to an understanding that involvement of teachers and children voice and idea in educational system creates possibility for improving both learning spaces and pedagogical approaches (Hart, 1992, Horm-Winged, 1993, Jones, 2004, Comber et al, 2006, Clark, 2010). In continue with this understanding, cooperation between the educationalists and designers in planning the kindergartens and preschool spaces is increased with the intention of creating a quality environment that will promote learning and creativity (Braun. 2011).

'Mosaic approach' by Clark and Moss (2001) can be considered as one of the most famous approaches within this stream, which discus the method for listening to children and adults and demonstrates how designers can use participatory methods for building relationships with the practitioners and children though talking, reviewing, walking and listening (Clark & Moss, 2011).

There are two main problems with this stream of researches. First problem is that the amount of theory that is generated from the user-participatory approaches is very limited due to lack of holistic model which would allow researches capture the whole process participator design from the beginning till the end. The second problem is that due to constraints in time and budget, participatory projects may not be always possible and this constraint prevents these researches to upgrade their findings constantly (Good & Robertson, 2006). So regardless of the attempts to improve the

design quality of spaces by considering the requirements of their central quality due to lack of tracking the respond of the design to the requirements of learning experiences after occupancy the strengths and weaknesses of these cooperation in not converted into theories.

### 3.2.3 Child-Centered Surveys

Children and adults perception of space and their surrounding is different. Adults see the spaces as the pre-defined patterns; however children see the spaces as the opportunities for doing. This differences result differences in a way children and adults experience spaces. Adults' experience of the space is about the way they use the space, however children experience the spaces through the messages spaces send to them (Day and Midbjer, 2007). As Paula Lillard states "children use the space to improve themselves but adults use themselves to improve the environment".

These types of differences shape another streams of researches that focus on the requirements of children's learning and development-based requirements and interpret the design quality of spaces accordingly. Within this stream, some researches focus on children psychological and developmental behavior such as David and Weinstein (2011) in 'Spaces for Children: The Built Environment and Child Development' whom look at the development and psychology of the child as a user of the physical environment and interpret the issues that will provide children's well-being in the space and Ece Sahin and Neslihan Dostoglu (2015) whom look at the qualities of outdoor spaces that can provide opportunities to support preschoolers' learning behavior.

Some other researchers were mainly after understanding the children's perception. Marilyn A. Read (1997) in her PhD thesis focused on 'The Impact of Space and

Color in the Physical Environment on Children's Cooperative Behavior' and found out that spaces with differentiated ceiling height and wall color increase children's stimulation and children's cooperative behavior. And in another approach Dudek (2005) explain that each child will shape his/her own perception about the learning environment and they will engage with the physical environment based on their personal perception. He also claims that children shape their perception of interior spaces through movements and using all of their senses and he believes that a perceptive design is fundamental in terms of creating quality spaces for children's learning (Dudek, 2008).

Some other researches in this stream like Feinberg and Keller (2010) has focused on specific functions within the field of early childhood education and interpreted the quality of interior design in relation to children's interest and developmental abilities. In general, most of these child-centered approaches believe that increasing children's interaction in spaces is the key to increase the quality of design in educational spaces for young children (Penn, 2011, Dahlberg, Moss & Pence, 2007, Gordon & Browne, 2014).

The problem with this stream of researches is that other contextual factors such as type of education, daily routine, staff/teachers' performance and interaction are not considered and in interpretation of children's interaction with spaces and due to these reasons most of the findings remain similar and fail to shape a holistic perspective on the relation of space and the learning environment of early childhood spaces.

### 2.3.4 Educational-Based Surveys

The fourth streams of researches include studies that deal with improving the design quality of preschool spaces in relation to the strategies of specific educational philosophy. Some of these contributions are as follow.

Loris Malaguzzi (1998) in 'Children, spaces, relations: metaproject for an environment for young children' describes designing quality spaces by considering the philosophy of Reggio Emilia and interpret the pedagogical and architecture/design issues by referring to the studies that carried out in the preschools of Reggio Emilia. In another approach Louise Boyd Cadwell (1997) discussed how design and arrangement of spaces can work as an educator and support children's learning by referring to Reggio's philosophy of design.

De Jesus (1987) in 'Design Guideline for Montessori Schools' propose a design framework in the light of enhancing the Montessori teaching methodology. This framework is established according to the written books and documents by Montessori and her educational belief and philosophy.

In another approach, Wiltshire (2013) in a chapter of her book discusses the space organization and characteristics of the environment in High/Scope preschools by looking at three variables: interest areas, storage and materials. And in parallel with his approach, Shirin Izadpanah and Kagan Gunce (2014) discuss the necessary characteristics of the spaces based on the aim and philosophy of High/Scope education and establish a design guideline to help designers and educators improve the quality of High/Scope preschool spaces.

These researches have a huge contribution in improving the quality of educational spaces in terms of enhancing central quality since they involve the requirements of education, children and teachers in discussing the design quality of spaces, but the results remains very specific and benefit the settings that either use the same methodology or their method share similarities with that specific educational approach.

### 2.3.5 Daily Experience-Based Surveys

The fifth streams of researches include studies that their intention is very much linked to the main purpose of current study. These studies attempt to involve the everyday experiences and patterns of daily routine of the educational settings in describing the design quality of spaces. Related with this issue in a general survey, Prakash Nair and Randall Fielding in 2005 established a study that defined six categories of school design patterns and based on these patterns they define new graphic vocabulary for planning and designing the new schools.

In continue with Nair and Fielding's study, Zane (2015, p.21) introduces seven categories of patterns that would increase the quality of design in early childhood classrooms and introduce six group of patterns that need to be available in an early childhood classroom in order to shape a quality learning environment.

The contribution of these approaches is vast in shaping the new concept of design quality in educational spaces, but since Nair and Fielding's study focus on schools environment in general it needs certain configuration in order to be adopted in preschool spaces and although Zane has done this configuration in her approach, but her patterns considers the overall life within early childhood classroom environment and do not focus on the situations and activities during each learning experiences.

The result of reviewing these five groups of approaches showed that the first four approaches lack certain issues in relation to the type of design quality that would central quality in learning environment of preschool settings. However the fifth group of approaches follow the Alexander's concept of 'Quality without a Name' and have a huge contribution in emphasizing the consideration of educational life of the settings in designing the spaces, but the number of these attempts are very limited and do not considers 'preschoolers and their everyday learning experiences' in particular.

The necessities of shaping the current research was due to the lack of focus on requirements of all the subjects of preschools' central quality including learning experiences, educational strategies, children's learning, teachers performance and parents' involvement of  in interpretation the design quality of preschool spaces. In following section the necessary design and arrangement of preschool spaces will be discussed in terms of requirements of central quality indicators during communal path of preschool learning experiences.

## 3.3 Design Requirements of Preschool Learning Experiences

In previous chapter the communal path of learning experiences that keep happening in leaning environment of preschools has been identified as 'developmental-based' and 'holistic' learning experiences (section 2.1) and subjects that shape these experiences has been classified as education, children, teachers and parents and has been defined as indicators of central quality (section 2.2). Interpretation of the requirements of central quality indicators during 'developmental-based' and 'holistic' learning experiences establish the patterns that children, teachers and parents need to experience in a quality learning environment (section 2.3). In this

section the requirements of design and arrangement of spaces will be discussed in relation to necessary patterns of central quality during each 'developmental-based' and 'holistic' learning experiences.

### 3.3.1 Design Requirements of Space During Developmental-based Learning Experiences

Developmental-based learning experiences in preschools include literacy, art, mathematics, science, blocks, dramatic play, music and movement area and gross motor experiences. The patterns of activities and situations are spaces vary during each of these experiences due to the differences in educational strategies during each of these experiences. In following sections necessary design criteria that need to be available in spaces to enhance the necessary patterns of activities and behavior will be discussed for each learning experience individually.

#### 3.3.1.1 Design Criteria for Literacy Center

As it was discussed earlier, literacy learning in preschool includes two main patterns of activities: print related and language related. Most of the patterns of experiences that enhance print-related and language-related activities are the same but there are slight differences that would require different design considerations.

- **Print Oriented Environment**

Creating a print oriented environment is a main design criteria that has been put forward by most of the researches (Morrow, 2007, Justice & Vukelich, 2008, Enz & Morrow, 2009, Mayesky, 2012). First requirement of designing a print oriented environment is arrange a space that promotes print oriented activities where children see variety of print oriented materials and activities and engage with the options that attract them.

Literacy space in order to respond to this requirement need to have a legible and attractive display of print oriented activities and materials. Literacy is mainly promoted through two types of materials (Bardige & Segal, 2005, Hanna, et al., 2010):

1. Learning materials: Materials that promote print oriented learning activities (books, notebooks, pencils, pens, stamps, magnetic letter and …).
2. Decorative materials: Materials that promote print (posters, signs, writing samples and …).

To have an attractive and accessible display for these materials, display units/elements should be attractive to arouse children's curiosity and their location, scale and orientation should allow children to have a direct visual and physical access to all the available options. Display of decorative items in literacy center generally requires surfaces. Like display units of educational materials, design, location and orientation of the surfaces or elements that display decorative materials should be inviting and legible. Parallel with appropriate display of materials, systematic adjacency will also enhance promoting print oriented activities. To shape systematic adjacency in literacy center, it is better to locate the areas that demonstrate print related activities next to each other (McKenna, Walpole & Conradi, 2010).

Second requirement for a designing a print oriented environment is providing support for children's positive interaction during print oriented activities. . Reading and writing are experiences that require certain amount of time to be productive (Morrow, 2007, McGee & Richgels, 2014), therefore seating units that allow teachers and children to read and write in comfort are necessary for a comfortable

interaction during the print oriented activities (Dudek, 2012, Feinberg & Keller, 2010, Bon, Cranfield & Latimer, 2011).

It should also be considered that children get variety of positions during reading and writing and for them floor is a stimulating seating option (Bardige & Segal, 2005). Considering certain amount of empty space with a soft covering will provide children with a surface to sit, crawl or laydown and allow them to get their interested position during reading and writing.

Parallel with the comfort, variety and arrangement of seating elements also is important for a quality interaction during literacy. It was discussed in previous section that children may prefer to engage in individual participation or cooperate with peers and teachers; therefore seating options should enhance group and individual exploration.

Providing a good lighting is another support for a good exploration and interaction during literacy. In area that reading and writing are experienced, the amount of light is very critical. Literacy area should not be bright or glaring and nor gloomy. Where the amount of natural light is less and more than enough, colors such as beige, light green and light blue that are not overly bright and neither somber can be preferred (Bardige & Segal, 2005).

A proper circulation network is another support that will enhance children's interaction and exploration during the print oriented activities. A proper circulation network in literacy center follows two main rules. The first rule is it should offers enough empty space for all the children who use the space to move around without

bumping to each other or existing furniture and objects. The second rule is that the system and organization of the circulation paths should guide children to move in between the materials so they can easily find and get their interested item (Gestwicki, 1999).

Technology today is considered as boost of exploration during literacy, since reading on screens proved to be supportive for children's literacy development. Creating a corner or small zone that digital devices such as computers, iPads or tablets are located by considering teachers' full vision over that spot will support children's literacy exploration (Openshaw & Soler, 2007).

Due to teachers' role as observer, facilitator and participant during literacy activities their interaction should be a matter of concern during the print oriented activities. Teachers should be able to make an immediate contact with children, so the amount of empty space in literacy zone have to allow their fast and comfortable movement and prevent them from disturbing children's spontaneous seating arrangements (Gestwicki, 1999). To enhance teachers for facilitating the literacy activities, offering variable and flexible furniture and elements is essential. The seating should allow rearrangements based on various pedagogical purposes (Evertson & Weinstein, 2011).

- **Linguistic Oriented Environment**

Second design criteria for a quality literacy center, is shaping a linguistic oriented environment. It has been addressed earlier that children's development of their language skills mainly happens through singing, storytelling and pretend play (Dickinson & Tabors, 2001, Morrow, 2007, Griffith, Beach, Ruan & Dunn, 2008), therefore the main requirement during these activities is providing a space for

communication and cooperation. Since pretend play will be discussed in specific (section 3.3.1.5) only singing and storytelling will be considered in this section.

Like print oriented environment, designing a linguistic oriented environment requires promoting linguistic oriented materials sand activities. Generally the materials that promote communication and language are considered as manipulative materials (poppets, tapes, tape recorders, boards or any other materials or object that help teacher and children create stories and conversation). Display of these materials need to be attractive and accessible for children (Grugeon & Gardner, 2000, Bardige & Segal, 2005). If singing is included in the program, displaying musical instrument that can accompany the singing activities is a good attempt to increase the quality of this experience (Hanna, et al., 2010).

Another support that would promote cooperation and communication is offering seating arrangements that encourage children group participation. The arrangement of seating units should offer compact sitting and increase children's eye contact with their peers and teachers while they are seated (Dudek, 2012).

After space promoted socialization and invite children to engage in language related activities, now the design is required to support children and teachers' positive interaction during the activities. The first support for the positive interaction is considering the practical layout. Practicality during storytelling means leaving an empty space that can be used as stage for story and locating a display or a storage that can serve objects that can be used during the storytelling experience or locating a rocking chair that can be used by teacher while reading or telling a story (Enz &

Morrow, 2009). Practicality during singing is creating options that allow children to listen to tapes and sing in groups or as individual without disturbing each other.

The second support is considering good acoustic solution that would control the noise. Using noise barrier materials on surfaces can be a good solution for controlling the noise during commutative activities. Some of the popular materials that reduce noise include vinyl sound barrier, hanging baffles and banners, wall panels, acoustical wall fabrics and ceiling tiles (Noisecontrolall, n.d).

#### 3.3.1.2 Design Criteria for Art Center

Setting up an appropriate environment is an essential strategy during the planning because children's development of creativity does not happen by an accident and requires planning (Mayskey, 2014). During art related activities, the process is way more important than the product (Goldhawk, 1998, Libby, 2000, Schwake, 2013, Beaty, 2014), therefore art center should be a space that allows children experience the process of art. The requirement of this criteria is providing and environment that inspires children. First concern that increase chance for children's inspiration is availability of flexible arrangement. Flexibility of furniture and elements allow teachers to create different set ups and change activities. Offering variety of art activities allows children to participate in the activity that inspires them the most (Mayskey, 2014). Flexibility of the sitting layout will also help children to get the position that inspires them the best (Koster, 2015).

The second concern that would inspire children about art is creating an appropriate display for art related materials. Art related materials can be classified as materials that create art and art products. Preschool children will be encouraged among variety of art materials and this will lead them to make creative experiences (Libby, 2000),

therefore display units/elements' location and orientation should be legible and visible. Since art leads children to self-directed activities where children choose their own activity and materials (Goldhawk, 1998, Beaty, 2014), display of art Martials should allow children's to get and returned the materials independently (Koster, 2015).

Legible and inviting display of art pieces and artworks will increase children's appreciation of art and inspire them (Libby, 2000). Providing visible surfaces and elements for displaying children's artwork will enrich the artistic environment. The location of these exhibitions should be in a place children visit on a regular basis and these artworks should be displayed in a way that prevent children's from drawing or working on the pieces (Mayesky, 2014, Koster, 2015).

Another requirement of a space that support children to experience the art is providing supports in space that allow children free art performance. First concern of providing children's free exploration is supporting their safety and security in space (Mayskey, 2014). To provide a safe space for art activities, design and arrangement of space should allow teachers to have a full vision over all the children and areas and the circulation path among the furniture and elements should be appropriate for teachers' proportion and allow them to move in between the areas easily (Koster, 2015). Children in order to have a safe and free interaction in space should be able to move around and access the materials without the chance any threat and hazard.

The second concern for a free art performance is providing children's comfort when they are doing art. Parallel with the appropriateness of the scale of elements and furniture for children's proportion (Schwake, 2013), children require variety of

materials during the art activities in order to be creative and due to this requirement the amount of space they need for art activities generally is more than the amount they require for reading or writing (Beaty, 2014). For comfortable art activities, children need enough surfaces to perform freely without experiencing any limitation.

Just like reading and writing, children like to get variety of positions during artistic activities. Surfaces that allow children to do art while standing (Schwake, 2013) and creating a floor that allows children crawl or lay down will enrich their comfortable art experience (Koster, 2015). Another feature that enhances children's free and comfortable art experience is providing a good lighting. A good lighting is a must for a comfortable art experience. Natural light or overhead lighting for areas that group work happens and task lighting where children will have solo experiences are two simple solutions (Schwake, 2013).

The last concern for children's free art performances is providing a place free from the worry of making a mess. The worry of being messy will prevent children from positive exploration. To provide an easy cleanup for children messy hands during art experience, there should be a water source nearby the art center (Mayskey, 2014). To allow the easy cleanup for the space, the materials that are used on the surfaces in art center should be easy to clean.

#### 3.3.1.3 Design Criteria for Math Center

Learning math in preschool is all about manipulation; therefore a space that enhances manipulation is the main criteria that need to be considered in designing the math center. First requirement of a space for preschoolers' manipulation is visibility and accessibility of the options. Children in order to be manipulative during math activities, require a space that allows them to have free access to manipulative

materials. A good display is the main support in providing children's access to materials in space and this means design, scale and location of displays should make the materials visible and accessible for children. Due to this requirement organization of the displays should be clear and well-defined. Considering children's visual contact with the materials in locating the display units is very important to provide children with a good sight over the area and opportunities (Stankovic, Tanic & Nikolic, 2013). The location and scale of the displays should allow children to reach their intended items independently. It is also necessary to consider that math requires variety of manipulative materials in variety of scales and types (Colorado Preschool Program Staff, 2012) and due to this requirement, the display units in math center should provide different amount of space for displaying materials with variety of scales.

Exhibiting the documentation of children's past experiences in math and displaying them in math center is a good attempt to motivate them for further plans and experiences. In this respects vertical surfaces in this area are essential elements in terms of increasing the quality of environment for mathematic exploration. The location and scale of these surfaces should be in a way allow all children see them from anywhere in the math center (Fullan, Luke & West, 2012).

The second requirement of a space for preschoolers' manipulation is providing children for free exploration. The freelance exploration requires a risk free and trustworthy environment, where children can freely investigate, recognize and generate their experiences and built understanding about math (Sammon, 2010). Variety of seating options is the second support for a free exploration. During math activities seating might be in groups or clusters, therefore either variety of sitting

arrangements should be existed or the design of seating units should provide the chance for creating group and individual sitting arrangements. While semicircular arrangement works best for discussions and communications, row seating is appropriate where children are interested to engage in individual experiences (Wannarka & Ruhl, 2008).

Another requirement of a space for preschoolers' manipulation is providing children's comfortable interaction. During math related activities teachers are very involved in activities; therefore space should respond to their participation in order to enhance their positive performance. To use the design and arrangement of math center as a good assistant for teachers, the amount of space and type and arrangement of the sitting units should allow teachers' comfortable participation and movement, while the overall arrangement of dividers and elements in space support their full view over children's progress.

As it was mentioned before, in math experiences sometimes teachers are required to provide situations and opportunities to challenge children and evoke their curiosity (Colorado Preschool Program Staff, 2012). To assist teachers for making new mathematic situations leaving enough empty space and providing certain level of flexibility in space would be helpful. The design and arrangement of math center should allow periodical changes to help teachers re-plan the environment based on their assessment on children's interaction (Puckett & Diffily, 2004). Enough open space by considering enclosed spaces for children's individual progress and locating light weight furniture would create a modified open space that allow teachers create changes based on their intended situation (Stankovic, Milojkovic & Tanic, 2006).

Math experiences are good opportunities for children to develop their communication and cooperation skills (Pecaski, 2015), therefore second criteria that need to be considered in designing the math center is providing a space that enhance social engagement. Requirement of a designing a social space in math center is providing supports that enhance socialization during math related activities.

Researches have proved that preschoolers become more cooperative, social and interactive while using computers, if the right software presented to them (Ching, 2009, Lee, 2009). Creating a fun and enjoyable environment will increase children's achievement and interest in math (LaRose, 2007, Ginsburg, 2009, Yelland, Butler & Diezmann, 2014). One factor that is essential in using the computers as positive elements in preschools is the way digital devices are located and arranged in the spaces. Computers should be located in a visible place. The location of the computers should allow the monitors to be seen from anywhere in the space (Lee, 2009). When computers are located next to each other, children will be more social and engage in discussion with each other while they use the computers (Mayesky, 2014).

The second support for positive communication during math is arrangement of sitting units. Sitting units in math area should encourage children to be involved in groups. With respect to the important role of questioning during the math dialogues, the semicircular arrangement is the best option in increasing children's engagement in this experience. Column and row arrangement should be avoided during the discussion and questioning since these types of arrangement reduce children's face to face contact and as a result their interest in socialization (Fuhrer & Hartig, 2000).

Good acoustic is the third support for teachers and children's comfortable socialization. Treatment of surfaces should avoid internal and external noises in order to increase the chance for teachers and children in understanding what have been said (Stankovic, Milojkovic & Tanic, 2006).

#### 3.3.1.4 Design Criteria for Science Center

Preschool science is a process of physical interaction with the objects and environment, therefore emphasize on the senses is the essential requirement in providing a space for hands-on discoveries (Blake, 2009 & Jackman, 2012). Due to this requirement providing an interactive space in science center is a main criteria that need to be considered in designing this area.

First design requirement of an interactive space in science center is visibility of options and materials. Children for a quality investigation and exploration need to observe and notice the options easily. Best display for science materials are low-level tables which would allow children see, choose and reach the materials easily. Generally these tables are called sensory tables and they provide great opportunities for children's exploration during science activities (Tsunghui, 2006). The design and arrangement of surfaces or sensory tables should encourage children to interact with the resources visually and physically.

Just like math and literacy, visuals such as science related pictures, charts and documentations are materials that increase children's sense of stimulation and increase their interest in science (Inan, Trundle & Kantor, 2010). Locating the vertical panels and surfaces that display the visuals in a visible spot will stimulate children for engaging in science experiments.

Second design requirement of an interactive science center in preschool is availability of sensory oriented design. The initial concern in a sensory oriented space generally is enhancing tactile experiences. Touch for a preschool child is the source of stimulation (MacNaughton & Williams, 2009), therefore surfaces that will be touched by children on regular basis can be covered by sensory materials such as wood, fabric, leather, fur and etc. (Yu, 2009). To increase children's sense of competence for a free interaction and maximum level of touch in space:

1. Major traffic paths in between the sensory tables/surfaces need to be physically and visually clear.
2. The materials should be displayed in children's self-accessed location and allow them to reach them without facing any threat.
3. The space should be generous in size and allow all children's involvement and reduce the need for waiting and sharing the same spot and materials in continuous way.

Another concern for enhancing sensory experience is providing visual stimulation. Engaging children with light and colors by designing special features in space that would create different reflections in the environment would increase children's exploration and sensation (MacNaughton & Williams, 2009). In a study Xue Yu (2009) classified as three items:

1. Ornament and scale: Ornaments are hard to be remembered therefore they are visually stimulating for a long time (Malnar & Vodvarka, 2004). Change in scale of elements and objects in spaces are also visually stimulating.
2. Sunlight: Adopting sunlight will stimulate the sight while increase children's cooperative behavior and concentration and support their health and growth (Kaller and Lindsten, 1992).

3. Kaplan's theory of preferences: According to Kaplan's theory coherence, legibility, complexity and mystery lead to understanding and exploration which both stimulate users' sense of sight (Kaplan & Kaplan, 1989). Coherence refers to providing a sense of order and directing the sense of attention. Legibility refers to spaces that are distinctive and easy to read. Complexity refers to providing visual variations and mystery refers to opportunities for users to go deeper into the environment (Abkar, Kamal, Maulan & Davoodi, 2011, p. 1992).

The third concern is creating sound stimulators. Offering opportunities that allow children experience variety of sounds would support children's to develop their investigation skills. Using surface materials that would result soft and melodic by being touched by children is a good solution to create variety of sounds that would support children's interaction without disturbing their sense of auditory (Carter & Curtis, 2014).

The fourth concern in enhancing the sensory experiences during science activities is curiosity. Every child comes to this world with a curious mind. This drive in children encourages them to find out everything they can. If the environment is restricted and does not provide a chance for creating situations and options that would stimulate children's wonder, children's curiosity will be shut down after a while (MacNaughton & Williams, 2009).

Curiosity is a drive that needs to be nurtured and encouraged (Spangler, 2009), therefor for support their sense of wonder physical space of science area should motivate them for more experiences and more interaction with their surroundings. Spaces that promote curiosity have certain level of flexibility and varieties (Carter &

Curtis, 2014). Flexibility and variety can be achieved by locating light-weight furniture, creating variety of levels, using variety of furniture types, creating different areas in different sizes, creating variety of heights, using variety of lightings, colors, patterns and etc. (Weinstein & David, 1987).

Third design requirement of an interactive science center is providing an appropriate space organization. Science center is recommended to be located in the sunny area and preferably next to the window.

This center mainly should include two zones: exploratory zone and discussion zone (Tsunghui, 2006). Exploratory zone is where small group and individual explorations happen (Harper-Whalen & Spiegle-Mariska, 1991, Tsunghui, 2006), therefore working arrangement that would provide individual and small group experiments would be appropriate for the experimental activities. Discussion zone is an area where introductions and group discussion happen. These discussions stimulate children for more discoveries and encourage their verbal collaboration (Inan, Trundle & Kantor, 2010). Locating a round table or a sitting arrangement that would increase children and teachers' eye contact would be appropriate for enriching the quality of this area.

As it has been mentioned before, teachers have an active and close interaction with children and therefore providing a teacher supportive space in science center is another criteria that need to be considered in designing the science center. Enhancing teachers' interaction in space is the main requirement of teachers' friendly science center.

During the science exploration teachers should be able to walk through the science area freely in order to assist children's discoveries and for accomplishing a better observation and assessment on children's experiences (Tsunghui, 2006). Due to this need, space should provide wide circulation paths, especially around children's working zone, in order to accommodate teachers' comfortable movement and interaction with children during their exploration.

Teachers' observation during the science experiments is integrated with their physical engagement and interaction with children and their experiences (MacNaughton & Williams, 2009). Beside the need for teachers' observation, participation of teachers in children's science discoveries is another positive attempt for supporting children's exploration (Tsunghui, 2006); therefore in designing and arranging the working areas teachers' comfortable performance and their easy interaction with children and display and resources should be implemented.

In science center teachers also need to rearrange the space for providing adequate space for children's exploration based on the intended experience or they might feel the need to extend children's spontaneous experiences by making sudden changes in the environment (Inan, Trundle & Kantor, 2010), so elements and furniture in science area should allow comfortable rearrangement.

#### 3.3.1.5 Design Criteria for Dramatic Play Area

Dramatic play is a complex play and yet the most important play in preschool age and help children to improve their linguistic and verbal skills (Jacobs & White). Dramatic play is effective when it offers intimate means of cooperation and communication among children (Ruth, et al., 2013); therefore main criteria in designing the dramatic play area is providing a space for sharing and communication.

First design requirement of this criteria is the appropriate space organization of the area. An appropriate design and arrangement of a dramatic play center that would serve the narratives of this will support children's age related requirements and developments and also encourage their imagination and enrich their role play experiences (Hereford, & Schall, 1991). The main intention during the dramatic play is to allow children talk and make sounds spontaneously; therefore the best location for a dramatic play area is somewhere away from the quiet area (Hereford & Schall, 1991).

Crowded spaces make cooperation for children difficult. If the amount of space and displays are limited in relation to the number of children and materials existed in that space, certain behavior such as push and complain will be occurred which will make the sharing and socialization difficult during this experience (Miller, n.d.).

Results of studies show that room with well-defined areas increase the socialization of children during dramatic play (Christie, 1991). Huge space without definite boundaries will result children's running and jumping and reduce cooperation and communication (Christie, 1991), therefor it is very important to spare enough amount of space based on the number of children and amount of materials, not too big and not too small. A good dramatic area should include well-defined stages to act, a well-defined storage and well-defined corner that provide costumes and dress-ups (Kishigami, 1988).

Through dramatic play children externalize their inner experiences somewhere in between reality and fantasy, therefore providing a space that encourages children to create pretend role is the second criteria that need to be considered in designing this

area. One of the design requirements of providing a space for creating pretend role is creating a layout that would evoke children's feeling of dramatization (Mellou, 1994).

Integration of the dramatic play experience with other physical activity areas such as gross motor area or block area (Hereford & Schall, 1991) and locating dramatic play close to the outdoor area to allow children and teachers for extending this experience to outdoor space (Trageton, 2005) will support children's dramatization.

Appropriate circulation is the second support for increasing children's dramatization. Dramatic play is full of movements and interactions and it is through the movement that children start to feel dramatic (Mellou, 1994). The organization of the circulation spaces in dramatic play area should support children's comfortable movement and provide their comfortable access to materials. Solutions that will create a good movement network during the dramatic play include (Plaything, 2012):

1. Optimal positioning of areas
2. Clear paths of movement
3. Clear boundaries between the areas
4. Low level dividers that would allow children view all the areas and options

Third support in space for dramatization of children is creating an iconic design in this area. The area for dramatic play should look different than the rest of the areas in order to encourage children to be dramatic (Hereford & Schall, 1991). Since props are meant to be the main elements during this experience, they can act as dividers and elements that shape the areas and circulations.

Another support for enhancing chidlren's dramatization is increasing the sensory experiences. Sensual experiences such as touching, smelling, tasting and listening are important in enriching the children's dramatization for (McGee & Morrow, 2005). Using mirrors, using different materials with variety of transparency and reflectance, using variety of colors and textures, using natural elements, providing a quality acoustic and using variety of objects will all be good attempts to support children's sensory experience during their role plays (Gascoyne, 2011).

Children should have an access to variety of materials and objects that would support them in creating role plays. Due to this importance, display is the most important item in designing space for creating role plays. An accessible and legible display of materials in this area is another support for enhancing children's dramatization, therefore:

1. To support children's imagination in creating new roles display of the props should bring them forward and define them as focal points in the space since they are considered as golden materials for dramatic play experiences (Beaty, 2014).
2. Outfits that will be used in personification role plays need to be hanged in an accessible and clear manner for children (Miller, n.d.).

Preschoolers' interested materials vary according to their age. Younger preschoolers need very realistic props in order to be engaged in dramatic play. However realistic materials will make four and five years old preschoolers become dramatic, they also can engage in dramatic play with low-realism materials and in this way even become more creative (Christie, 1991, p.36). In this respect, classifying the 'realism' and 'low realism' materials with different displays will lead the preschoolers to their preferred materials easily.

Therapists and educational workers have classified the functions of dramatic play as the process of exploring the self and self's environment (Mellou, 1994) and this means that children are required to get supports from space in order to enriching their role play. Consistent with this issue, another requirement of creating a space for creating pretend role is providing supports that would increase the quality of role play procedure for children.

First support to enhance the procedure of role play is locating a mirror in this area. Mirror is a very important element that supports children's dress up experience. Placing full length unbreakable mirrors somewhere that allow all children to have a vision of their appearance during role play will make this experience more fun and sensual (Hereford & Schall, 1991, Woodard & Milch,, 2012).

Second support is providing empty spaces that would act as stages for children's role play. Children in dramatic play create play episodes and imaginary situations and they require empty spaces in order to shape their scenes (Kernan, 2007). To provide children with a quality space for pretend play, this area should include well-defined empty spaces to act as stages for children's spontaneous role plays (Kishigami, 1988). These spaces can be defined by appropriate placement of props and furniture within the dramatic play area.

Teachers play an active role as supervisors of dramatic play and therefore providing a space that would increase teachers' intervention is the third criteria that need to be considered in designing the dramatic play area. Since dramatic play is expected to be a play that happens spontaneously without any control and direction of the adults (Beaty, 2014), space and organization of the space should allow teachers have a full

vision over all the areas and children and support them to set the stages and themes based on their intended strategies. To assess and support children's play during dramatic play, teachers need to be clear about what children generally do during this experience (Ruth, et al., 2013). Low level dividers and partitioning will improve the teachers' supervision over the whole environment.

Teachers play an important role in creating the stages of pretend play and setting up the themes (Beaty, 2014, McGee & Morrow, 2005). Changing the themes frequently will encourage children's imagination for creating new roles and situations (Jacobs & White, 1994). To allow teachers set up new themes during dramatic play, the amount of space and arrangement of the objects and furniture should allow teachers to readjust the space and materials easily. For a comfortable readjustment, design and arrangement of display and furniture should provide certain amount of flexibility to allow teachers include or exclude objects and materials for supporting the daily themes (McGee & Morrow, 2005). Considering a well-designed storage close to this area will also assist teachers and children in changing the themes and materials (Fisher, n.d.).

#### 3.3.1.6 Design Criteria for Block Center

Children's independent interaction during the block experience will support their motor development, ability of sorting and classifying and also increase the sense of control (Provenzo & Brett, 1983, Beaty, 2013, V.T., 2013, Harms, Clifford & Cryer, 2015) and moving the blocks from where they are stored to the place that they will be used by children is one of the main patterns during block activity (Provenzo & Brett, 1983). In regard to this patterns, therefore the main criteria that need to be considered in designing the block area is providing children's get and return of blocks in space. The main requirement of this criteria is designing appropriate

displays. Using shelves for displaying the blocks is generally more functional. The best display element for blocks is shelves (Riley, 1991). Shelve displays in block center should have certain characteristics such as:

1. Shelves should be placed in children's eyelevel (Beaty, 2013).
2. Shelves should be in variety of dimensions based on the size of the display blocks.
3. Shelves and blocks should be numbered in a clear manner to represent the location each block and support an easy return of materials for children (Harms, Clifford & Cryer, 2015).
4. Display of blocks should group and classify the blocks based on their types and shapes (Harms, Clifford & Cryer, 2015).
5. Display of blocks should be visible from anywhere in the block center (Riley, 1991).
6. Large blocks should be displayed on shelves that are located lower than children's height to provide a safe get and return experience (Wellhousen & Kieff, 2001).

Second requirement of providing children's get and return in block center is appropriate circulation path. First support to shape a good circulation system in block center is creating moving paths that would control children's movement and prevent them from disturbing children's that are engaged in the construction experience. Second support for shaping an appropriate circulation network is the location of enters and exits to this area. Enter and exits to this area should be located in a way that does not cross the spaces that children use for building their blocks (Kearns, 2007) and also displays should be located on the sides, to allow children reach the materials without crossing the construction spaces.

The second important pattern during block activity is engaging children in process of construction (Hughes, 2009); therefore enhancing this process is second criteria that need to be considering in designing block center. First requirement of providing this criteria is appropriate organization of this space. Block area should only be allocated for only block play and it is better to not serve any other purposes (Harms, Clifford & Cryer, 2015). Block area should be located somewhere away from the daily traffic and out of the path of settings' active circulation (Nielsen, 2006). It should also be far from the quiet area since it is a noisy activity (Riley, 1991, Wellhousen & Kieff, 2001).

The boundaries of the block center should be well-defined and visible (Nielsen, 2006). It is preferred to enclose the block area from at least three sides in order to create a closure and allow children enjoy their experience without worrying about any interruption that would destroy their work. When children work in a defined space they also come to a better understanding about the concept of the space (Wellhousen & Kieff, 2001). The definition of the space should be carried out by using physical barriers in order to shape a secure space.

The process of building and structure during preschool age varies based on two main factors, age and number of participants during the experience. Generally amount of space that is required by younger preschoolers is less that the amount of space that older preschoolers need. The reason is that younger preschoolers mainly work with fewer blocks (Harms, Clifford & Cryer, 2015). The required amount of space for block experience also varies based on the number of children who participate in a same experiment. During this experience sometimes children bound up to build

cooperatively (Beaty, 2013), so they will need a larger space for building their blocks.

Consistent with these discussions, Block area should have plenty of empty space, based on the number of children who use the space in order to increase children's creativity during this experience. The size of this area should be large enough that allow children extend their structure (Provenzo & Brett, 1983) and allow all the children spread out their blocks comfortably without disturbing others' territory (Riley, 1991).

Another requirement for enhancing the process of children's construction is providing their comfort. Generally the main surface that is preferred by children during the block experience is floor (Nielsen, 2006). In this respect floor in block center should be treated with soft materials to allow children have a safe and comfortable building experience. Although floor is the main working surface, but if small construction blocks such as Legos and Lincoln logs are available in block center, tables would be necessary for children during working with these materials (Provenzo & Brett, 1983). The scale of the table should be based on children's proportion and provide enough surface for them to spread the materials and build their block structure.

Third requirement of enhancing children's the process of construction is aesthetic to keep children interested. The block center should be aesthetically attractive for children in order to invite them for participation. Since preschoolers find the spaces that involve all their senses attractive, using variety of textures and colors and also providing a good path of movement to increase their stimulation in the area will

increase the attractiveness of this center for them (Kearns, 2007). Using the vertical surfaces for hanging picture of buildings and structures in this area will also inspire children and identify the activities that are offered in this center (V.T., 2013).

Final requirement of enhancing children's process of construction is through enhancing children's collaboration with children in space. Due to active role of teachers as observer and participants during block activities, design and arrangement of block center should enhance teachers' collaboration by providing them a full observation and comfortable participation. Teachers need to have a full vision over children in block center to allow them engage in a free exploration. Teachers' full observation also is necessary since they need to assess children's activities during this experience (Nielsen, 2006, Beaty, 2013).

Creating challenges by teachers for children will support children's cognitive development; therefore sometimes teachers would be participating in children's activities (Beaty, 2013). The amount of space and design and arrangement of the block area should allow teachers to sit and work with children without occupying children's personal spaces.

#### 3.3.1.7 Design Criteria of Area for Music and Movement

In respect to importance of movement in increasing preschoolers' level of exploration and physical development, creating a child-focused movement environment gains huge amount of attention in designing preschool spaces (Berk & Winsler, 1995). Music and movement that in preschools is considered as part of the gross motor activities is a fun and exciting activity that allow preschoolers express their feelings through movement rhythms, support their interaction with other peers and expand their vocabulary of movement (Kowalski, Kennedy & Jackson, 1992,

Clements & Oosten, 1995). Since supporting children's movement is the main goal during this activity, shaping a movement oriented layout is the main criteria that need to be considered in designing this area.

A movement oriented layout requires an appropriate space organization. It is better to locate the space for music and movement somewhere far from distractions and noisy activities (Picca, 2009). In this way noise and other distractions will not ruin the quality of music and would help children to be focused and involved in the experiences.

Another support for organizing an appropriate space during music and movement is proper placement of equipment. Locating equipment, furniture and materials near the surface such as walls and baseboards and leaving enough empty space (based on the number of children that use the space) in between, will allow children to move and interact with items without bumping to each other or hitting the objects and furniture (Sanders, 2002).

Preschoolers need enough space in order to experience a creative and positive movement (Taylor, Morris, Meredith & Hicks, 2012). Appropriate amount of space for dance is very essential. Large open spaces support children's free movement direction while small spaces limit the patterns of movement (Lorenzo-Lasa, Ideishi & Ideishi, 2007). During music and movement activities, space is divided into two components: personal and general space. Personal space is the space that surrounds child's and general space is the rest of the space that child share with others outside of his personal space. Both of these spaces include three main dimensions (Pica, 2009):

1. Level of movements:

- Low (close to the ground)
- Middle (while standing)
- High (on tiptoe and in the air)

2. Spatial direction of movement:

- Forward and backward
- Right and left

3. General pathways of movement

- Straight
- Curving
- Zigzagging

An adequate space for music and movement is the amount of space that allows all these dimensions of movement for all the children in safety. Defining certain spots by using carpet squares or different texture and colors on the ground would help children to find their personal space (Thomas, Lee & Thomas, 2008). It is also important to remember that in very large spaces, boundaries have to be established carefully. By using tapes, ropes or plastic cones, it is possible to define appropriate boundary within the large spaces (Pica, 2009).

Second requirement of movement oriented layout is supporting children's independent movement. In spaces that teachers need to carry the objects and materials for children, children's movement will be limited (Sanders, 2002). If during the movement and music activities certain objects and materials will be used, it is necessary to provide children's independent access to those materials to support their movement.

Another support for children's free movement is providing safe physical content. Floor is an important surface to support children's motions during the music and movement. To make the floor comfortable and safe, it is necessary to soften its surface and avoid slippery materials. Wooden surfaces are the best options and the second option can be carpet (Picca, 2009). In spaces that floor surface is not appropriate, laying down mats and soft materials on the floor during the music and movement activities allows children to use the floor efficiently (Edwards, Bayless, & Ramzey, 2009). In spaces for music and movement activities, there should be no furniture and objects that have sharp and pointed corners (Picca, 2009).

Third requirement of shaping a movement oriented layout for preschoolers is enhancing their sensory experiences. Visual, auditory, kinesthetic and tactile are the main sensations that support children's experience through movement and music (Dunn, 2001). For a quality music and movement experience space should reinforce these senses. In this respect, space for movement and music should respond to children's sensory awareness. Through visual and kinesthetic senses children need to feel and see the shape and action of their movement and see the images they create (Boyd, Chalk, & Law, 2003). Placing mirrors on the surrounding surfaces allow children to see the image of their own body and other peers during the movements and enhance their sense of visual and kinesthetic. Light is another important factor that can support children's visual and kinesthetic senses. Special lighting design can visually support the movement and by emphasizing the beats of the music (Kassing, 2007).

To support children's auditory senses it is necessary to create an environment that children can hear the sounds and respond to it with their motions (Boyd, Chalk, &

Law, 2003). For playing a quality music there is a need for a good sound system and acoustic solutions. This means (Binggeli, 2010):

1. Locating amplifiers, sound controls and suitable speakers that avoid distraction and distortion of sounds.
2. Treat the surfaces such as wall, and ceiling with sound absorbing materials.

Through tactile experience children require to touch objects, equipment and surfaces through their motions (Boyd, Chalk, & Law, 2003). In order to support children's tactile experience, space should provide children with variety of materials that would be touched by children during their movement activities.

#### 3.3.1.8 Design Criteria for Gross Motor Area

Generally the gross motor center is the space that features equipment and materials that promote development of movement and physical skills (Beaty, 2014). The main criteria in designing the gross motor area is supporting physical activities. First requirement of this criteria is providing a space organization that encourage children to be involved in movement and gross motor activities. To provide this requirement specific zones such as climbing, running, standing, jumping and etc. need to be included organizing the layout of this area (Roopnarine & Johnson, 2013).

The best step towards organizing a quality space for gross motor skills in preschool is to create stations under the category of main skills a child needs to gain during the gross motor experiences. Beaty (2014) categorizes these skills as follow:

1. Walking Station: A station that features materials and equipment which promote walking.

2. Running Station: running generally is suggested outdoor, but if there is enough empty space available indoor, this station should allow activities that would promote running.

3. Galloping Station: This station generally include riders or objects that would allow children to experience riding.

4. Jumping Station: A jumping station promotes jumping and mainly free standing baseball is the requirement in this station.

5. Hopping Pad Station: In this station children hop on their foot independently or by holding on to specific elements.

6. Leaping Station: This station can work even by taping a section of the area and inside that section offer the activities that would encourage children to leap across something.

7. Balancing and Bending Station: In this station children will learn to balance and bend and the activities that would feature these movements generally changes on a weekly basis.

8. Stretching Station: Stretching is a very simple gross motor activity that actually can be developed in any station which allows children to have enough personal space for following their teachers' movement.

9. Throwing and Catching Station: This station would allow children to throw and catch by using variety of balls.

10. Climbing Station: This station can be featured in a corner of the center by using equipment and elements that would encourage children to climb off such as climbing wall or large hollow blocks.

In order to control the arrangement and location of each station based on the skills children are experiencing in each area, the appropriateness of each station for

children's patterns of movement during these skills need to be taken into consideration. Preschoolers' patterns of movement during the gross motor activities consist of three phases (Charlesworth, 2014, p. 266):

1. Preparation
2. Action
3. Follow through

Each station should allow children to experience these three phases in safety and comfort. Leaving enough empty space for fall and use zone is an important concern in organizing the gross motor center. Fall or use zone means the space under or around the gross motor equipment and the placement of equipment should be in a way that teachers and children enough space to move around without crashing the equipment or other children in the space (ncrlap, 2012). Apart from the fall and use space there should be certain amount of unoccupied space for spontaneous physical activities (Johnston & Williams, 2009).

Gross motor related activities require variety of objects and equipment. Generally working with these object and the equipment requires certain amount of space (Gordon & Browne, 2013), therefore the gross motor space have to have enough space based on the equipment and the activities that the objects offer to children. Linking the gross motor area directly with the outdoor space can extend the opportunities for children to carry on their gross motor activities outside and this will increase their sense of exploration and joy for further physical development skills (Drake, 2003).

Second requirement of supporting physical activities of preschoolers in gross motor area is providing a safe environment. Gross motor center should support children's physical safety and teachers' psychological security in order to enhance children's free exploration. Design and arrangement of the space should be in a way that allows teachers encourage children for using their full range of abilities without being anxious. To support children's physical safety (Gordon & Browne, 2013):

1. The movement patterns in the gross motor area need to be free of any hazard and danger
2. There should be enough room for children who use the space and prevent crowd
3. There should be enough empty space based on the number of children and equipment
4. Floor should be covered with the soft materials where there is a chance for children to fall down
5. Equipment and objects should be well-maintained

To enhance children's safety and support teachers' active interaction and assessment during the gross motor activities, shape, organization of equipment and elements, size of the space and the amount of empty space should allow teachers to see and reach children easily (ncrlap, 2012).

### 3.3.2 Design Requirements of Space during Holistic Learning Experiences

Holistic learning experiences in preschools include arrival and departure, cooking practice and dining and toilet and hygiene practice. Following sections will discuss necessary design criteria that need to be considered in spaces in order to help children develop certain skills and behavior during each holistic learning experience.

### 3.3.2.1 Design Criteria for Transitional Spaces

Experiences during arrival and departure are important in terms of helping children's development of social and emotional skills. The transition through the entrance happens in a place where the public outside world is linked to the more private inside world (Ford and Hutton, 2007) and stated by Christopher Alexander "the experience of entering the building influence the way you feel inside the building (Alexander et al., 1977, p.549)". In respect to this statement, during experience of transit it is impossible to avoid the role of in and out relationship in evaluating the entry hall. Due to this necessity, the outdoor organization of the transitional spaces and their relationship with the experience of arrival and departure will also be taken into consideration.

Influence of street and procession, way finding and identity are three main design criteria that are necessary for creating quality experiences during the transit. These three criteria are the elements that have been introduced by Alan Ford and Paul Hutton (2007) in their book called 'A Sense of Entry: Designing the Welcoming School' as elements for designing a successful entrance and provide a quality sense of transit for users.

The main requirement of creating influence of street and procession in outdoor space of preschool settings is providing a typological depth before building's' entry. A direct and sudden entrance from the street without any transitional spaces in between destroys the sense of arrival. The transitional spaces between the street and the entrance help visitors to get rid of their street behavior before they enter the building (Alexander et al., 1977). One of the main supports to provide this requirement is creating transitional spaces in between entry of the setting from the street and

settings' building entry. As the number of in-between spaces increased (by including porches, gardens, gates…) the value of the topology will be increased (Bekkering et al., 2008) and as the procession from the street to the building will be more influential.

Another item that will improve the typological depth in outdoors space of preschools is providing series of varieties and changes while leading the visitors to the setting's entrance (Snell & Callahan, 2009). Transition is experienced when changes happen (Blythe, 2011). It is the physical changes through the transit that creates the psychological transition in people's mind. Designing physical patterns such as change in light, color, sound, direction, surfaces, levels and view (Alexander et al., 1977), using different outdoor furniture and objects, using physical barriers and other similar solutions (Snell & Callahan, 2009) will enrich the experience of transit for children and their parents.

As it was mentioned earlier, the second criteria for a good experience of arrival and departure is providing a way finding entry. The main requirement creating a way finding entry is shaping a systematic circulation path. The circulation system that links the street entry to the setting has to direct the visitors (parents and children) to the main entrance and secondary entrances (if there is any). To define a clear transit circulation, dominant aspects of outdoor circulation such as pedestrian clearway, sidewalks, pavements which lead users' movement to the settings' entrance, have to be clear and follow a logical navigation system (Mantho, 2014).

Parallel with a logical navigation of circulation path visibility of the entrance will enhance parents and children to find their way when they enter to the setting from the

street. The entrance(s) of the setting has to be visible from circulation paths that connect the outdoor spaces (parking lot or playgrounds) to the setting's building. If the setting has several entrances they all have to be treated like the main entrance and they also have to be linked to the street entry with a logical circulation network (Meiss, 2011).

Third criteria for a quality arrival and departure experience in preschool settings is designing an identical entrance. As it is stated by Goldsmith "A great entrance invites you to start an architectural journey. It draws you in and seduces you to enter the building (Goldsmith in Wright, 2014)". The design of the preschools' entrance needs to be exciting and communicative in order to attract children and their parents and motivate them for entering the setting. An identical entrance of a preschool setting has to be visually representative and physically warm, welcoming and informative (Dudek, 2000, Nicol, 2007). Designing an identical entrance can be approached though two main design considerations: designing an identical visual character and designing an identical physical character.

Thirumaran and Babu (2014) in an empirical study investigated the effects of design elements of entrances on perceived image of the observers and investigate the factors related to the perceived image of the entrances based on the concepts that are identified by Kevin Lynch in his book "image of the city". These concepts include form identity, visual scope, dominance, legibility, sensory stimulation and figure-ground perception. The first four concepts can be adopted as necessary items to control the strength of visual character of preschool setting's entrance from the outside.

It is important to continue the visual character of the entrance inside the entry hall as well and make visitors to continue their pleasant experience after they enter the setting. In order to create a visually warm and attractive entrance, overall characteristics of the entrance hall such as lighting, color, textures and objects have to be inviting and attractive. Adding variety of colors, using plants, bringing in the natural light (Bucholz & Sheffler, 2009) and personalizing the entrance by using children's photographs (Hodgman, 2012) can all be simple design solutions that would create a visually attractive entry hall. In general, a visually warm and attractive entrance is an entrance that excites and pleases the children.

Entrance of the preschool setting has to be welcoming (Nicol, 2007). Locating a welcome desk or a reception area can create a visual security for both children and parents (Haywood, 2007). The location of the entrance desk should not create crowd at the entry. Crowded entrance halls will be visually stressful and overcome the welcoming character of the entrance. Creating an immediate visual contact with someone who will greet the visitors will create a sense of security for both children and their parents (CABE, n.d). This will be very comforting in case of children who are not experiencing their first visit to the setting and are familiar with the staff faces.

The second criteria for creating a quality experience of arrival and departure in preschool settings is designing a physically identical entry hall. Main requirement of this criteria is providing a functional entry hall that serves the patterns during arrival and departure of children and parents. Sometimes leaving the parents may be difficult for children and they will experience certain amount of anxiety (Essa, 2007). The quality design and organization of the entrance hall can ease this process and enhance a good transit experience. The main activities that happen during the arrival

and departure is waiting and greeting. This is the time that parents, children and teachers will socialize. Building a trust between teachers and children is an important issue and the most appropriate time to build this trust is during children's arrival at the setting. To build this trust, teachers need to observe children, learn their mood and behavior and interact with them accordingly. The appropriate interaction with children will improve the experience of transit when parents leave the setting (Carson-Dellosa Publishing, 2011). Waiting space/area has to allow children full observation of arriving children and have enough space to prevent crowd.

Including a waiting area/space in an entry of the preschool setting is one of the most important attempts for creating a positive transition for adults and children (Dudek, 2000). Arrival gives children a chance to start socializing with their peers and transition is a good time for parents and teachers to share their issues about children (Hayes & Creange, 2001). The design and arrangement of the area needs to encourage the social communication between children, parents and teachers during children's arrival and departure and in this respect both adults and children have to be considered.

As it was already discussed, increasing the sense of security in the entrance will ease the process of parents and children separation. Locating the administrative office at or close to the entrance (Dudek, 2000) or locating a reception desk (CABE, n.d.) will reassure the parents that their children are at the safe hands and seeing familiar faces will be pleasant for children during transition. Locating teachers' office at the entrance will improve their transit too. Generally before children arrival and after their departure, teachers need some time to plan and assess the daily routines (Raines & Canady, 1990, Miller, Dalli & Urban, 2012). Locating their office close to the

entrance will allow them to speed up this process and allow them to have control over the entrance if there is an early arrival.

Locating the entry hall in a place that children can easily access the main activity spaces will create a logical indoor navigation and there won't be any need for signs (Dudek, 2000). Placing the children's main areas at entry level is a good solution to provide a logical indoor navigation and safe movement for children after the transit (Feinberg & Keller, 2010). The logical indoor navigation from the entrance will allow teachers and children to reach the target space/area after the transit and even older preschoolers can enter the activity areas until all the children are arrived and daily routine is started.

Offering children the opportunities such as special activity area/space at the entrance or creating a direct visual and physical link to an activity area will capture children's interest and ease their separation from their parents and encourage them to start their day (Traub, 2010). Including a playful activity in an entrance will create an exciting transit experience for children and a positive start in the setting.

#### 3.3.2.2 Design Criteria for Kitchen

Children's participation in preparing, serving and cleaning during the meal time or cooking activities is a very good opportunity for children to experience independency (NJ Department of Education, 2010). Necessary designs criteria in kitchen or the spaces that are dedicated to preparation of food by children are very much related to the level children are allowed to be engaged in cooking activities. This section considers the full interaction of children during cooking learning experiences and interprets the requirements accordingly.

Cooking in preschool is all about practice, therefore first criteria that need to be considered in designing the kitchen is support for children's cooking practice. First requirement of a supportive space for children's cooking practice is providing their free interaction. For young preschoolers recipes that does not involve heating an using sharp utensils are suggested and the experiences generally goes around tearing vegetables, mixing ingredients, plucking fruits and etc. which will require using the counter top or tables surfaces (Essa, 2013). To provide children an independent experience during serving or preparing a meal, counter heights should be appropriate for their proportion and location of the counters should allow all the children to use them easily and independently (Salant, 2011).

Second item that will allow children's free interaction during cooking practice is defining an appropriate circulation network for their comfortable movement. If kitchen is used by children, the amount of empty space and furniture should accommodate all the children who use the space without creating traffic (Salant, 2011). In general the circulation routes should direct children to the zones that they should be navigated to (Ballast, 2013), therefore to control the access and traffic flow it is necessary to define patterns of children's interaction in the kitchen and then control the appropriateness of the circulation system for these patterns.

Another item to provide children's free interaction in kitchen is supporting their safety. To support children's safety specific elements, dividers or barriers should be used to block children's traffic flow towards the dangerous zones such as heaters, stoves and cabinets that store the sharp utensils. If children are participating in serving and cleaning during the meal time, the empty space in kitchen should be

wide enough for the number of children who will enter the kitchen and provide an easy flow for their interaction (Mesher, 2010).

Second requirement to support children's practice in space is providing a proper space organization. The location of the kitchen is related to the functions it serves in the preschool setting. Mainly it is recommended that kitchen have adjacency with the main circulation route, entry zone and eating area and it is also a good attempt to create a physical link between activity area and kitchen if children are permitted to enter the kitchen (Dudek, 2000, US's general Services Administration, 2003, Levitt Goodman Architects, 2012, Department of Education and Children's Services, n.d). Even if children are not allowed to enter the kitchen, creating a visual link to the kitchen from the activity areas or corridors will help children learn about nutrition and food preparation (Levitt Goodman Architects, 2012).

Third requirement of supporting children's practice in kitchen is providing teachers' full supervision in space. Recipes that require teachers' minimum supervision will support children's independence and discovery (Mayesky, 2008), but supervision and participation of the teachers in cooking activities is necessary. Planning and arrangement of the area that children use for cooking activities should allow teachers' full observation and comfortable interaction (Feeney, 1992).

Fourth requirement of supporting children's practice in kitchen is increase their interest in practice by enhancing their social interaction. In general to increase the eye contact and verbal communication it is better to provide furniture arrangement that shape round working groups instead of side by side working arrangement

(Russo, 1974). To increase the social competence in the kitchen (Kostelnik et al., 2006):

1. Storage and displays that materials are kept should be easily accessible for children so that children can put away the materials they use.

2. Arrangement of furniture (tables or counters) should allow children to work together and support their interpersonal skills.

3. There should be a place to display children's final work so that children can contribute to the peers and support their positive self-identity.

4. The amount of display units should allow providing variety of materials and tools to give children the chance of choice in selecting the materials and activity they are interested.

#### 3.3.2.3 Design Criteria for Dining Area

A well design eating area in preschool will encourage children's healthy eating habits (Center for Ecoliteracy, 2010). For enhancing the experiences during the meal time providing pleasant dining and enhancing the culture of dining through design are two main criteria that need to be considered in designing this area in preschools. The eating period is the time which both teachers and adults can relax and it is considered as a break in between of the daily activities (Wilson, 2011, Fromberg, 2012). Creating a pleasant dining environment requires providing children and teachers physical comfort during meal time. One of the important factors that provide a comfortable eating for teachers and children is their seating arrangement. The sitting areas have to be clearly defined and scale and design of chairs and tables should allow teachers and children to eat their meal in comfort (Health Promotion Agency for Northern Ireland, n.d.). It is preferred to provide a seating that allow both teachers and children eat all together.

Amount of empty space in dining space will also influence the teachers and children's sense of comfort. A good balance between the empty space, number of users and amount of furniture will prevent overcrowding, reduce sense of stress and increase sense of comfort (University of Virginia, University of Nebraska Medical Center & VMDO Architects. n.d.).

Noise is another factor that will bother teachers and students and prevent them from having a comfortable mealtime. Using acoustic panels, lowering the ceiling (if the space is not small), using noise absorber floor covering materials like vinyl, using soft materials (chairs cover with soft materials or curtains) and providing a sound system to play a soft music during the mealtime will reduce the amount of noise in dining area (School Food Trust, n.d.).

A bad lighting will reduce teachers and children's sense of comfort during the mealtime. The dining space should not be too dark or too bright (School Food Trust, n.d.), since users are satisfied with the level of lighting, they find spaces more attractive and comfortable (Martin & Oakley, 2008).

Another factor that will support teachers and children's sense of comfort in dining space is indoor air quality. During the mealtime there should be a balance between the indoor temperature, humidity and fresh air in order to provide a quality eating experience (Martin & Oakley, 2008). To enrich the environment of the eating area, locating this space in the area that have a visual link to the outdoor space can bring the natural light inside this space, provide natural ventilation and also allow children and teachers enjoy the outdoor view during their mealtime.

The second requirement for creating a pleasant dining environment is shaping an appropriate layout. Flexibility of the seating elements is an important feature that will allow the teachers and children set up the arrangement that suits their interest best for (Health Promotion Agency for Northern Ireland, n.d.). To create a flexible dining environment without destroying the identity of dining the seating elements need to be light weighted, easy to move and also appropriate for experience of dining. Providing flexibility in dining room should not overcome the subject of identity in dining environment. Flexibility will be a necessity especially in small dining areas or in the settings that use the dining area for other events and activities too. If dining area is used for different activities there is a need for an appropriate storage close to this area to store the furniture and elements.

The dining area should also be adjacent to the food serving area in order to provide an easy and secure food distribution during the meal time. This space generally is the kitchen, but this might vary based on the food policy of the settings (Perkins & Bordwell, 2010, Child Care Canada, 2011). Hygiene is an important concern in preschool settings and the eating time is a good opportunity to practice this issue with children. Where dining area has an access to the lavatories, children can easily reach the basins to wash their hands before and after their meal.

Third requirement of a pleasant dining environment is providing a comfortable circulation during the meal time. An adequate circulation space in dining area means enough space for children and teachers to circulate during serving and cleaning up In order to create a safe circulation it is better to locate the tables away from the traffic flow during the meal time. During the start and towards the end of mealtime, there will be a dynamic flow between the lavatories, dining area and food serving area.

The flow between the food serving area and dining area specially applies for the settings that children are participating in serving and cleaning the food (Martin & Oakley, 2008, Fletcher et al., 2005).

To have safe traffic flow, the amount of empty space in dining area should create appropriate circulation paths for an easy flow from the seating area to the food serving area and lavatories. These circulation paths should have the capacity of preventing the traffic and providing physically and visually legible paths towards the lavatories and food serving area.

Last requirement of a pleasant dining environment is shaping an identity that represents the culture of eating and dining. In many settings the dining area is used for other activities and events. This functional flexibility should not destroy the identical layout and arrangement of this space and culture of dining (Fletcher et al., 2005, School Food Trust, n.d.).

#### 3.3.2.4 Design Criteria for Lavatories

The way toilet is used varies according to different culture and religion. Although nowadays most of the residential places include toilet sits in standard equipment, there are still regions that use toilet equipment based on their religious and culture. In china for example, there are still regions that toilet, especially in public places, are troughs instead of sits (Tobin, Hsueh, & Karasawa 2009)", or based on the Muslim religion, separation of boys and girls are expected. In this respect; the design of lavatories and type of its sittings should be evaluated within the scope of the program and cultural and social condition of the region (Adams, Sims, Bartram & Chartier, 2009).

Preschool children need to experience a comfortable toilet and hand washing experience in order to be motivated to independent participation in this experience, therefore the main criteria in designing the toilets in preschool is supporting their pleasant practice while using the lavatories. Main requirement of this criteria is providing children's physical comfort.

Toilets in order to be used by children in safety and comfort have to fit their proportion and scale. For a comfortable toilet experience, child should be able to rest his foot on the floor or a stool and toilet seats should be appropriate for his size (Adams, Sims, Bartram & Chartier, 2009, Gretchen, Peacock & Holland, 2003).

Using toilet in preschool age is all about training and developing children's sense of confidence and independence. If children are expected to experience use the toilet on their own, fixture such as sinks, drawers or cabinets and towel hangers need to be located based on child's proportion, so that child can accomplish the actions safely on his own (Schmidt, 2002).

Parallel with the physical comfort, the design of the lavatories also needs to provide children's visual comfort. The overall image of lavatories is expected to be calming otherwise it will increase the sense of stress and pressure which will make this experience difficult for both children and teachers (Dudek, 2000). To make this experience fun and interesting and reduce the sense stress, providing interesting design features will make the visual look of lavatories attractive and exciting. Expressing specific themes by using special wall papers and fixtures and using bold colors and interesting patterns on the surfaces can convert the lavatory to a fun and attractive environment (Airoom, 2014).

If children need to use pullout tools, stools or any other equipment to use the existing toilet independently, these equipment need to be kept in a specific space/storage inside the lavatory (Airoom, 2014). If toilet training experience is included in the program, there is a need for storage to keep the relevant equipment and keep them out of the children's reach when teachers are not around (American Academy of Pediatrics, 2011).

Second requirement of designing a lavatory that enhances children's pleasant practice is organizing this space in proper manner. First item for organizing a good lavatory in preschool is a proper location. Young children cannot control their bladder and they need to reach toilet quickly (American Academy of Pediatrics, 2011), therefore if only one lavatory is available, it is better to locate the lavatories where it can be shared among the clusters of classrooms and activity areas (Wright, Mannathoko, Pasic, UNICEF, & Division of Communication., 2009). In preschool setting, lavatories should have a central location (Bickle, 2007) and they should not located in tiny, left over spaces since this space is important facilitators of children's learning and social experiences (Dudek, 2000).

Second item of organizing a functional lavatory for preschoolers is considering the necessary adjacency of this space with necessary areas. Teaching children to wash their hands regularly requires a well-defined and accessible sinks. Due to the importance of hand washing in supporting children health, sinks also need to be accessible to children without any barriers and somewhere close to the area that messy activities happens (Adams, Sims, Bartram & Chartier, 2009, American Academy of Pediatrics, 2011). Ideally it is expected to create a direct access to toilets from the classroom or main activity areas, but if this is not possible creating a

corridor access by considering the visual supervision of adults can also be a helpful design solution (National Resource Center for Health and Safety in Child Care and Early Education, 2014). Leaving the main entrance hall of the lavatory where generally the sinks are located open, will create a visual access between children and this experience (Bickle, 2007).

Third item of organizing the lavatory space is consideration of enough empty space based on the number of children and the required space for toilet training. Toilet training includes undressing, wiping, flushing, discussing, washing hands and dressing up (Pediatrics, 1999). Due to the process of this training, it is important to provide an adequate space that can serve all these actions without creating a crowd, chaos and stress.

Last item that need to be considered in organizing the lavatory space is providing children's line of sight to this area from the main activity spaces in the setting. There should always be a chance for teachers to supervise children when they enter the lavatories. It is important to design and arrange the entrance of the lavatories in the teachers' line of sight or range of hearing (Bickle, 2007, American Academy of Pediatrics, 2011). Providing a partly open toilet that allows visual contact from the classrooms and activity areas can be a positive attempt to support teachers' supervision. Using 'line of sight' policy is a good solution for choosing the location and design of the lavatories. 'Line of sight' means maintaining adults' constant supervision of children all the time (Kliman, 2011).

Last requirement of supporting children's pleasant practice during using the lavatory space is providing their sense of privacy. Giving each child his own space during the

toileting experience will enhance children's sense of security and teach them to respect one another privacy in the toilet (Tobin, Hsueh, & Karasawa 2009). Using low-level partitions between the toilets will create a sense of privacy while it allows children to socialize and develop positive attitude towards this experience. Height of dividers should keep children off the vision while seated, but allow them to have an open vista towards the lavatory spaces when they stand up (Dudek, 2000).

In this section the necessary design criteria that would respond to the indicators of central quality during each learning experiences in preschool were discussed. The established theory indicates the transactional relationship between the design and learning environment of the preschool settings that would enhance the quality without a name in spaces.

# Chapter 4

# A MODEL PROPOSAL TO EVALUATE DESIGN QUALITY OF INTERIOR SPACES IN PRESCHOOL SETTINGS

In this section the design criteria that have been discussed in section 3.3 will be classified into subsets in order to shape a framework of the evaluation model. This classification have been established by taxonomy analysis of the theories that has been established to describe the necessary design criteria of each 'developmental-based' and 'holistic' learning experiences' (section 3.3.1 and section 3.2.2). The scope of taxonomy analysis has been identified as follow:

**Subset 1:** Category (The intended developmental-based/holistic learning experience)

**Subset 2:** Evaluation criteria (The initial design criteria that is necessary to be considered in space in order to respond to requirements of central quality during the intended learning experience)

**Subset 3:** Quality indicator (The necessary requirement of the design criteria that need to be enhanced by the design and arrangement of spaces)

**Subset 4:** Evaluation items (The design characteristics that need to be available in spaces in order to answer the requirement of the design criteria)

The reason for classifying the established theory into three subsets is providing the steps that would guide the inspectors to have better understanding of the scope of evaluation and help them to shape more sensitive and accurate reports on the strength and weaknesses of the items.

In second section of this chapter, appropriate methods that mainly were used in previous researches for evaluation of architecture usability, interior space usability, design usability and early childhood situations and experiences were investigated. The outcome of this investigation establishes a list of methodologies that have been suggested for evaluating the quality and usability of architectural spaces. By considering the aim and objective of proposed evaluation model in this study, methods that would be appropriate for research objectives were excluded and the new techniques of evaluation were established by restructuring and combing the excluded methods.

Process of restructuring the new methods was accomplished by keeping the characteristics of original methodologies that would fit the intentions of current evaluation model and eliminating the features that would not be necessary in line with intentions of evaluation in current study. The elimination has been done carefully in order to avoid undermining the reliability of the excluded methodologies.

After the main concept of the model's evaluation methods were identified and restructured, these methods enter the 'item specific restructure'. During item specific restructure the content of the selected methods were defined based on the scope of evaluation for each item. At the end of this section the final framework of the model were established. In final stage of this section a manual is established to prepare inspectors to use the model in an accurate manner before, during and after the evaluation.

## 4.1 Structure of Evaluation Criteria of the Model

In this section the established theories in section 3.2.1 and section 3.2.2 are classified into subsets to shape the structure of the quality evaluation model. Figure 8 shows the schematic representation of the taxonomy analysis that was adopted for each 'developmental-based' and 'holistic' learning experience.

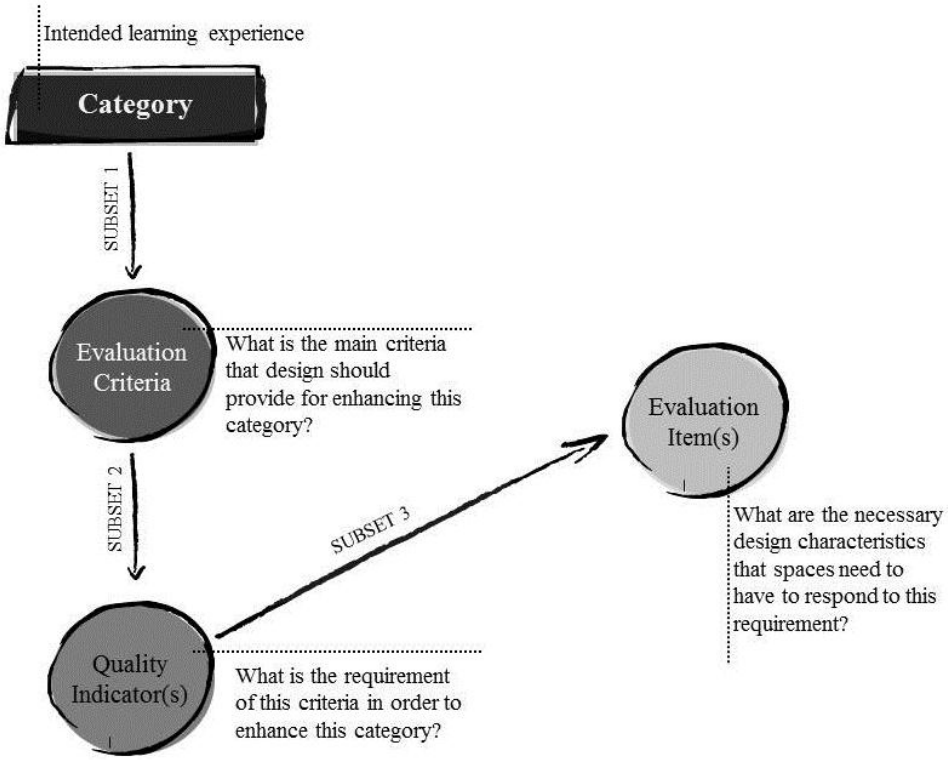


Figure 8. Schematic representation of the taxonomy analysis for shaping the framework of the quality evaluation model for preschool interior spaces

### 4.1.1 Taxonomy Analysis of Developmental-Based Learning Experiences

Developmental-based learning experiences in preschools include literacy, art, mathematics, science, blocks, dramatic play, music and movement area and gross motor experiences. Taxonomy analysis of these eight categories is as follow.

#### 4.1.1.1 Literacy Center

First category of this group of 'developmental-based' learning experiences is literacy. As it was discussed in section 3.3.1.1, two main design criteria that need to be considered in literacy center include providing print oriented and linguistic

oriented environment. Based on the established theory in this section the subsets of these two criteria are as follow.

**1. Print Oriented Environment**

First design requirement of a print oriented environment is promoting print oriented activities and to provide this requirement space needs to have appropriate display units and offer systematic adjacencies for print oriented zones. The second requirement of a print oriented environment is providing support for children and teachers positive interaction during the print oriented activities. Design of space in order to respond to this requirement needs to provide appropriate sitting arrangement, enough amounts of lighting and a proper circulation system. Literacy center also requires offering a well-designed computer zone and teacher friendly layout (Figure 9).

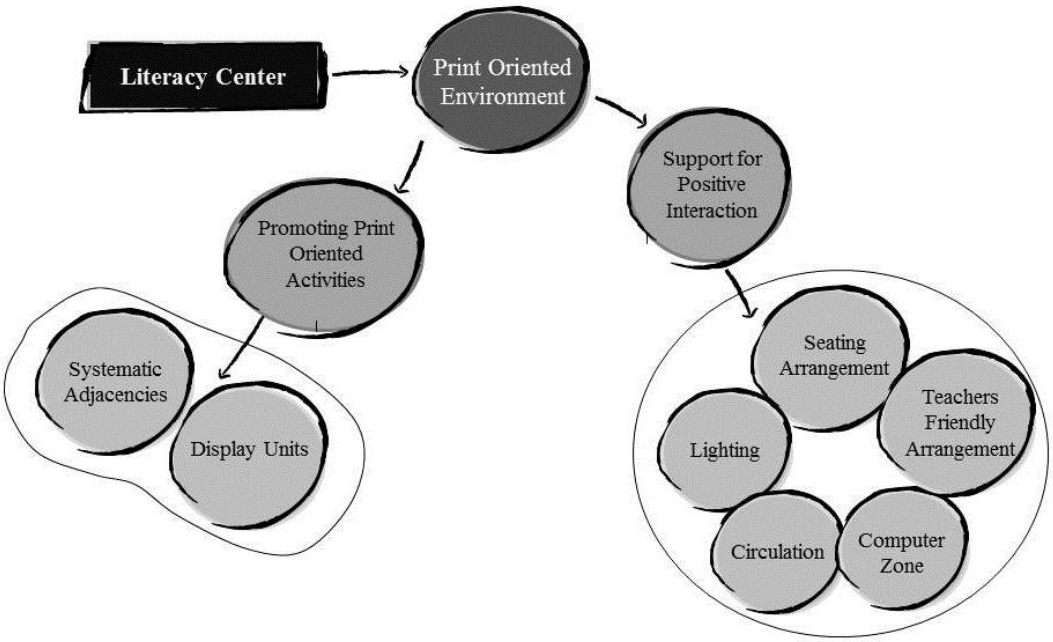


Figure 9. Design requirements and design characteristics of a print oriented environment in preschools' literacy center

**2. Linguistic Oriented Environment**

First requirement of providing a linguistic oriented environment is promotion of linguistic oriented patterns. Design of literacy space needs to provide appropriate display units and social seating arrangement to respond to this requirement. Second requirement of shaping a linguistic oriented environment is providing supports for children's linguistic skills. Design of literacy center needs to have a practical layout, and offer acoustical solutions in order to respond this requirement (Figure 10).

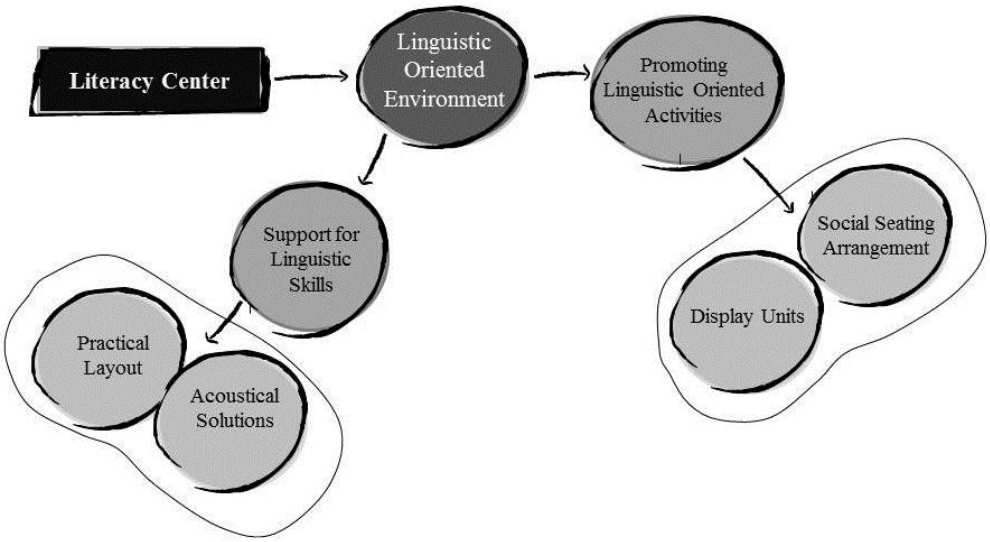


Figure 10. Design requirements and design characteristics of a print oriented environment in preschools' literacy center

**4.1.1.1 Art Center**

Second category of 'developmental-based' learning experiences is art. As it was discussed in section 3.3.1.2, main design criteria that need to be considered in art center is providing a space that allow children experience the process of art. Based on the established theory in this section the subsets of this criteria are as follow.

**1. Space for Experiencing the Process**

First requirement of providing a space that enhances children to experience the process of doing art is shaping an inspiring environment. Design of art center in

order to respond to this requirement needs to have a flexible layout and appropriate display for art products and materials. Second requirement of a space that enhances children to experience of doing art is providing supports that allow children's free exploration. Design of art center needs to provide safety, comfort, and variety of seating options, appropriate lighting and hygiene oriented consideration to respond to this requirement (Figure 11).

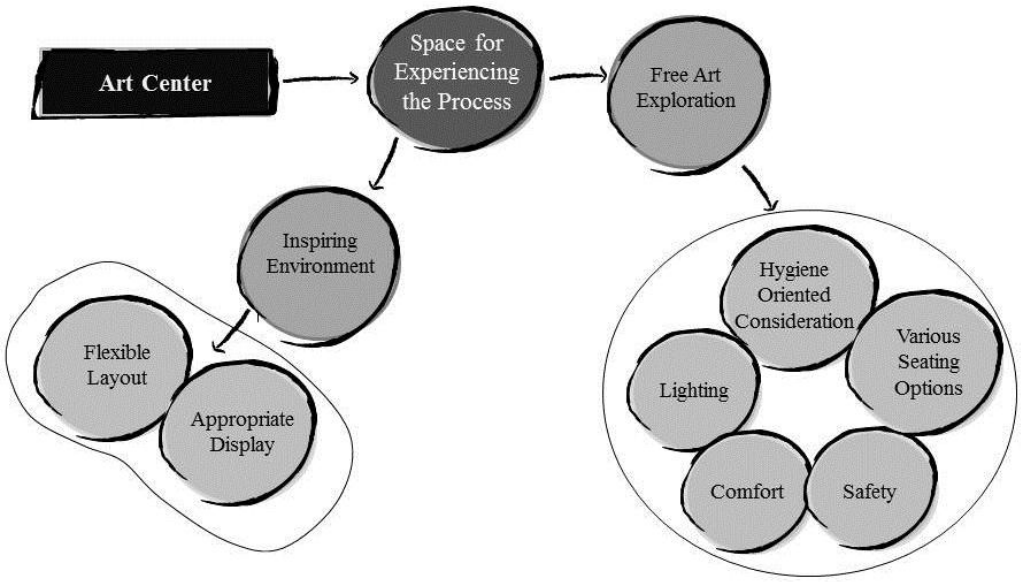


Figure 11. Design requirements and design characteristics of a space that enhance children experience the process of art in preschools

#### 4.1.1.3 Math Center

Third category of 'developmental-based' learning experiences is mathematics. As it was discussed in section 3.3.1.3, main design criteria that need to be considered in math center are designing a space for manipulation and space for socialization. Subsets of these two criteria are as follow.

**1. Space for Manipulation**

Providing visibility and accessibility of the math oriented options in math center is the first requirement for creating a space that enhances children's manipulation. Space needs to provide appropriate display of materials to respond to this

requirement. Second requirement of a space for manipulation is supporting children's free exploration. Providing safe interaction and variety of seating options are two main design characteristics that will respond this requirement. Third requirement of space for children's manipulation is supporting teachers' comfortable interaction by providing their full visual contact, comfortable participation in activities and designing a flexible layout that help them rearrange the design (Figure 12).

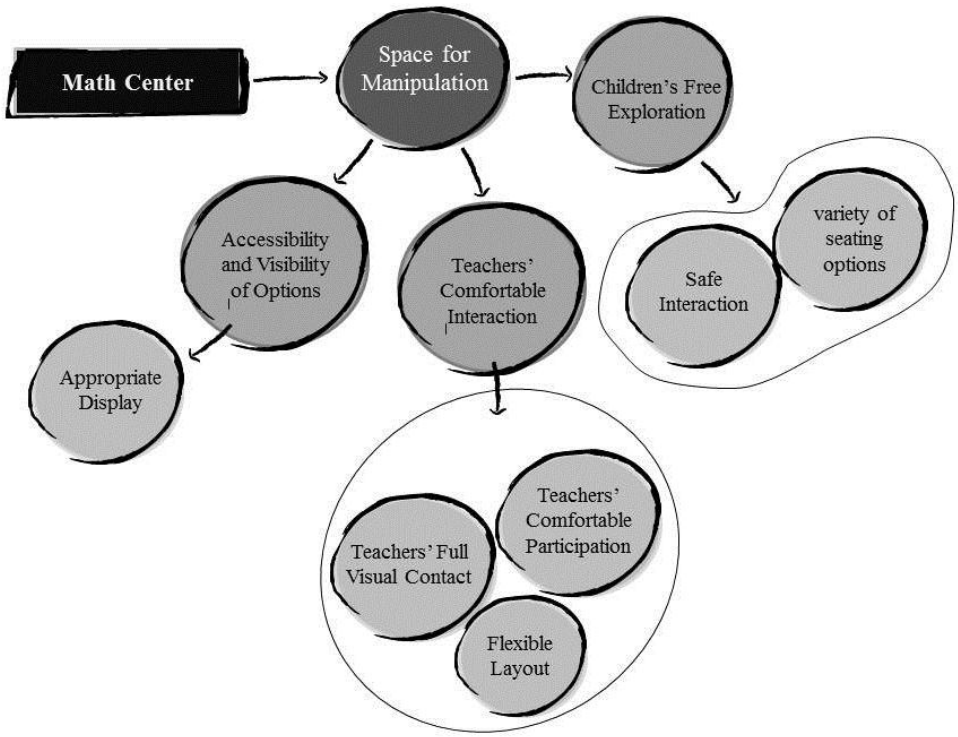


Figure 12. Design requirements and design characteristics to shape a space for manipulation in preschools' math center

**2. Space for Social Engagement**

Providing supports for increasing the socialization of children and teachers during math activities is the main requirement for shaping a space for social engagement. Providing a well-designed computer zone, appropriate layout for group interactions and acoustical solutions are the design characteristics that will enhance this requirement in math center (Figure 13).

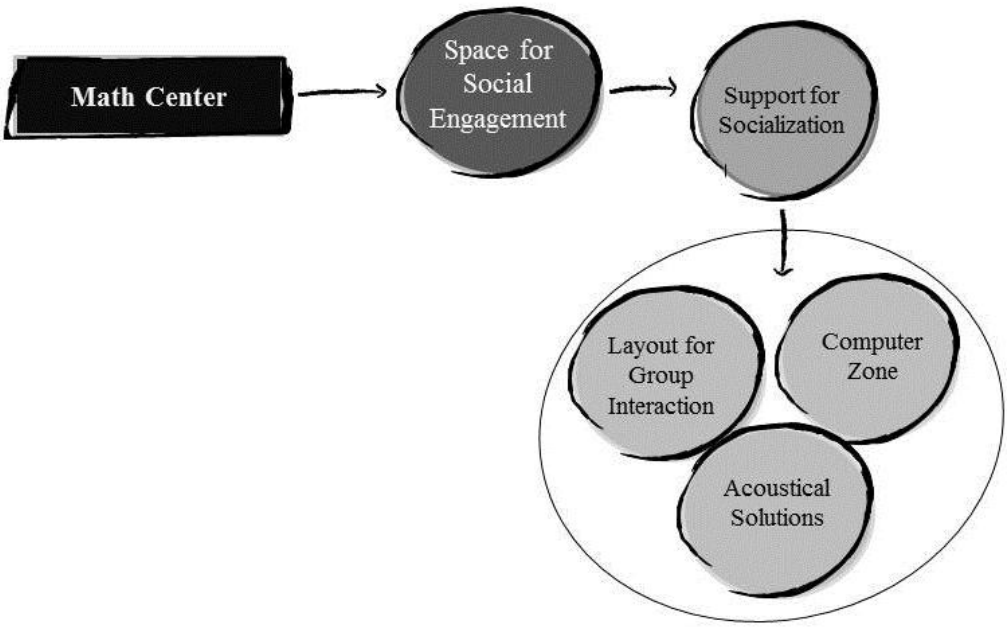


Figure 13. Design requirements and design characteristics of a space for social engagement in preschools' math center

#### 4.1.1.4 Science Center

Fourth category of 'developmental-based' learning experiences is science. As it was discussed in section 3.3.1.4, designing an interactive and teachers' supportive space are two main design criteria that need to be considered in science center. Subsets of these two criteria are as follow.

**1. Interactive Space**

To design an interactive science center it is to emphasize the visibility of the options and material and to support this requirement displays need to be visible to children and a sensory table need to be located in this space. Another requirement of an interactive science center is increasing the sensory experience of children by providing a sensory oriented design. To provide this requirement there is a need for a proper traffic path, safe and independent access of children to items, enough amount of empty space, visual and sound stimulation items and enhancing children's sense of curiosity in space. Third requirement of an interactive science center is providing an

appropriate space organization, this requirement needs proper location of the center and providing explanatory and discussions zone within this center (Figure 14).

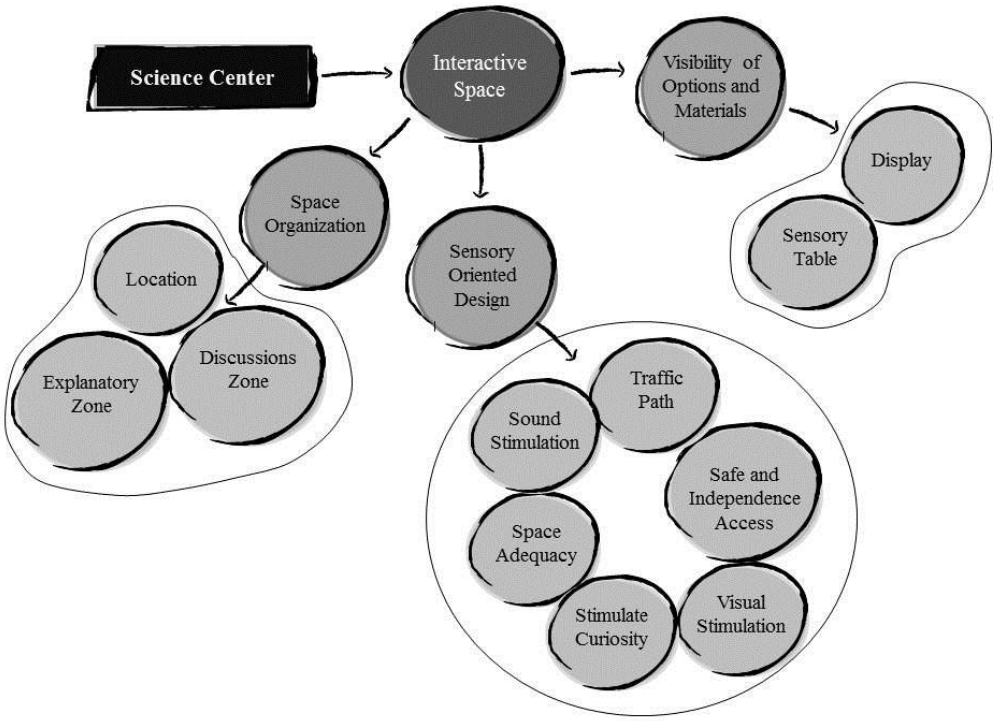


Figure 14. Design requirements and design characteristics of an interactive science center

**2. Teachers' Supportive Space**

To design a science center with the intention of supporting teachers' performance it is necessary to support teachers' interaction during science learning activities. Designing an appropriate circulation network by considering teachers' movement, providing teachers' full visual contact to environment and support their comfortable participation is necessary design characteristics that are required to support teachers' interaction in science center (Figure 15).

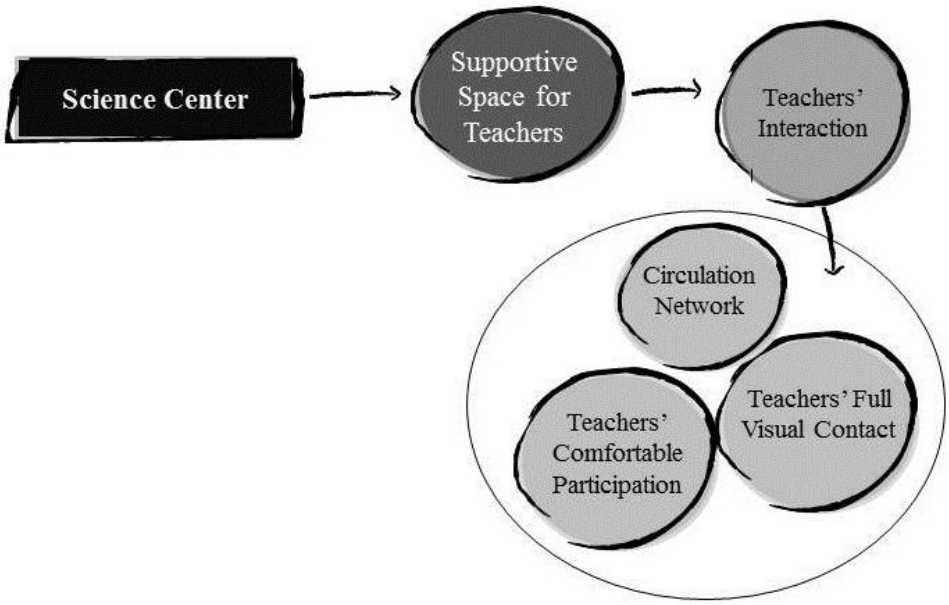


Figure 15. Design requirements and design characteristics of creating a supportive space for teachers in preschools' science center

#### 4.1.1.5 Dramatic Play Area

Fifth category of 'developmental-based' learning experiences is dramatic play. As it was discussed in section 3.3.1.5, designing a space that increase children's sharing and communication, a space that support children to create pretend role and a space that increases teachers intervention are three main design criteria that need to be considered in designing dramatic play area. Subsets of these three criteria are as follow.

**1. Space for Sharing and Communication**

A suitable space organization is the first requirement for designing dramatic play area that will increase children's communication. Location, definition of the boundaries of the area, providing zones that support children's process of role play and leaving enough empty space are the main characteristics to respond to this requirement (Figure 16).

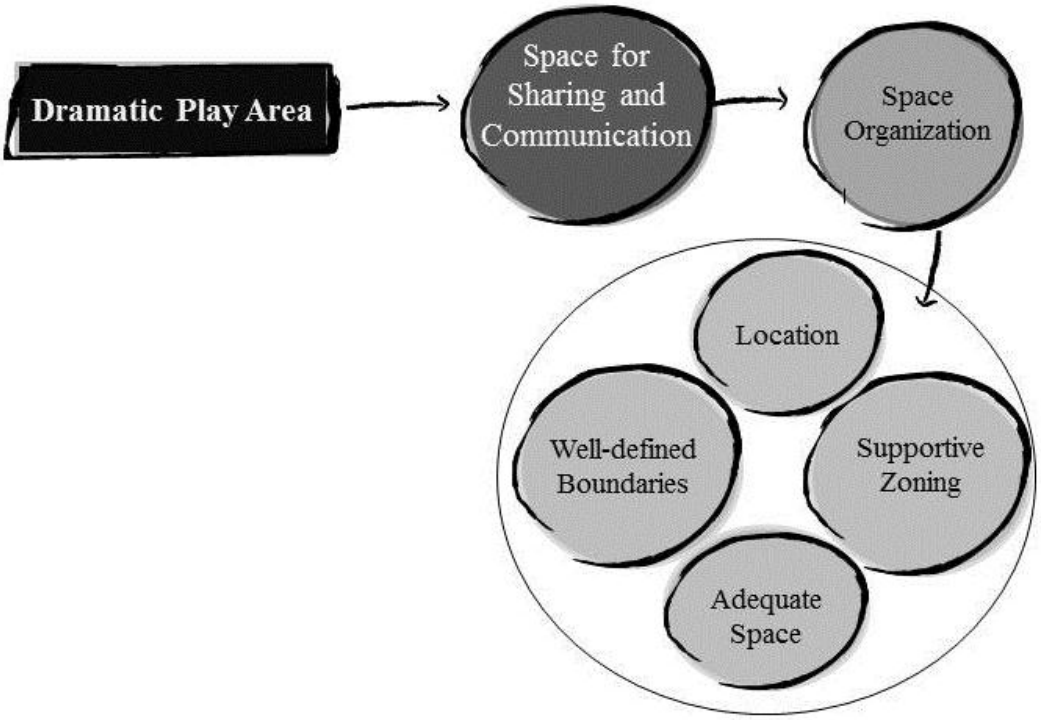


Figure 16. Design requirements and design characteristics of creating a space that support children's communication in preschool's dramatic play area

**2. Space to Create Pretend Role**

Main requirement for designing space that encourages children to create pretend roles is providing a layout that increases children's sense of dramatization. Considering necessary adjacencies, providing a circulation system, plotting out the iconic features of this play, offering sensory oriented features and offering an appropriate display are the design characteristic that will respond to this requirement. Second requirement is providing supports that will enhance children's procedure of role play by locating a mirror and do an appropriate planning (Figure 17).

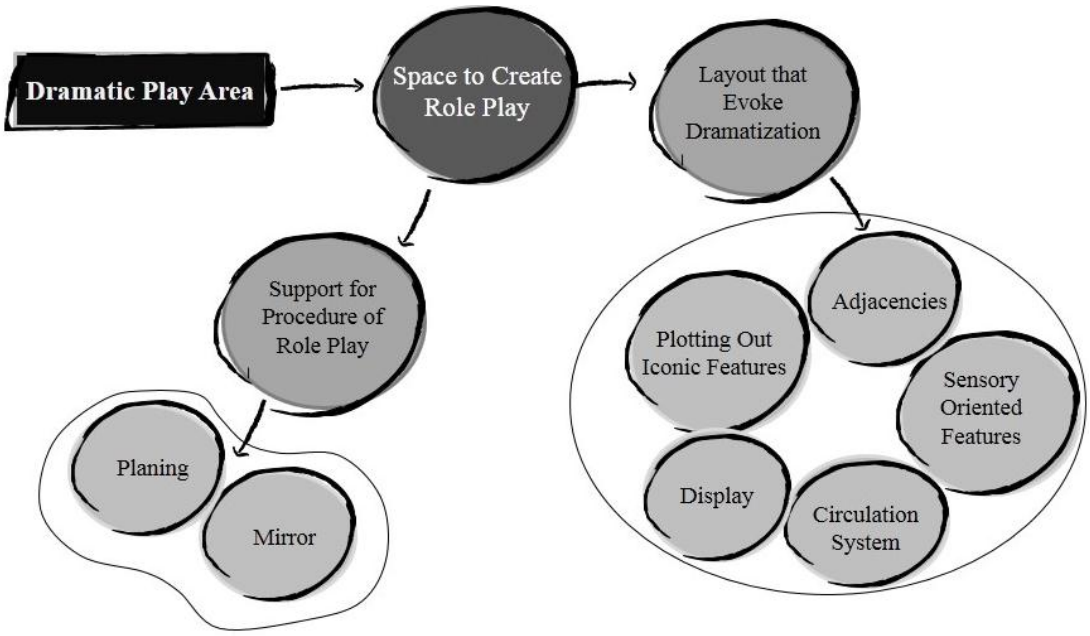


Figure 17. Design requirements and design characteristics that enhance children to create role plays in preschools dramatic play area

### 3. Space that Increases Teachers Intervention

Teachers to have a better intervention during dramatic play require a full supervision towards the whole content of this area, therefore design of space should provide their full visual contact with all children in dramatic play area. Second requirement of teachers' intervention is providing a design that allows them set up variety of themes in this area. Creating a flexible layout and locating a well-designed storage in this area will allow teachers to create variety of themes (Figure 18).

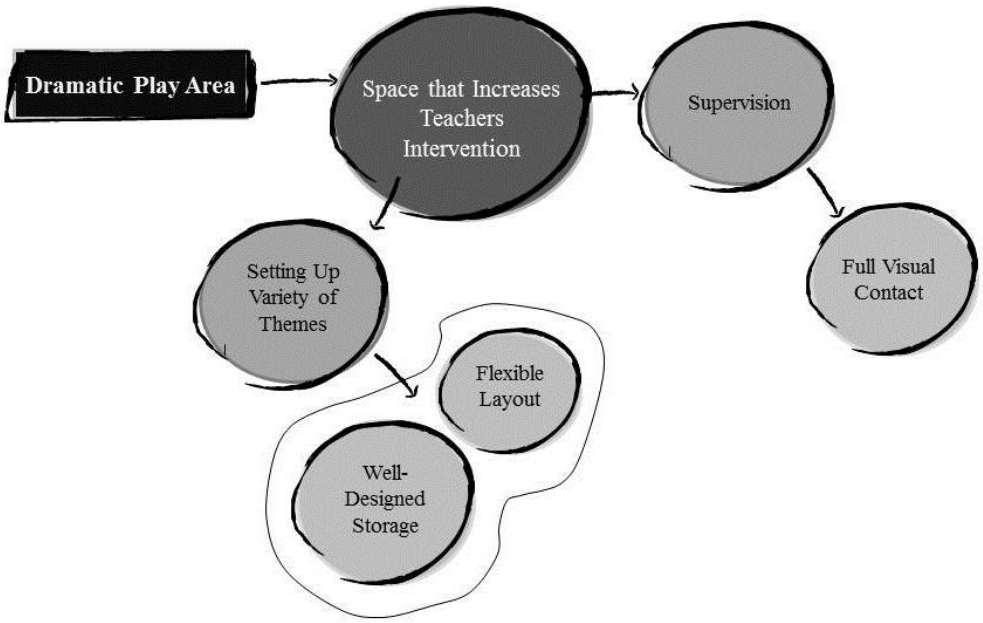


Figure 18. Design requirements and design characteristics that support teachers' intervention in preschool's dramatic play area

#### 4.1.1.6 Block Center

Sixth category of 'developmental-based' learning experiences is block. As it was discussed in section 3.3.1.6, designing a space that allows children to get and return the blocks and enhance their experience of block construction are two main design criteria that need to be considered in designing dramatic block center. Subsets of these two criteria are as follow.

**1. Enable Getting and Returning the Blocks**

To allow children to get and return the blocks independently main requirement is an appropriate display. Using shelving system that is appropriate for displaying blocks is the design characteristics that would respond to this requirement. Second requirement for children's independent access to blocks is providing appropriate system of circulation. Defining systematic path of movements and define an appropriate location for enters and exits to this area are two main features that need to be considered in responding to this requirements (Figure 19).

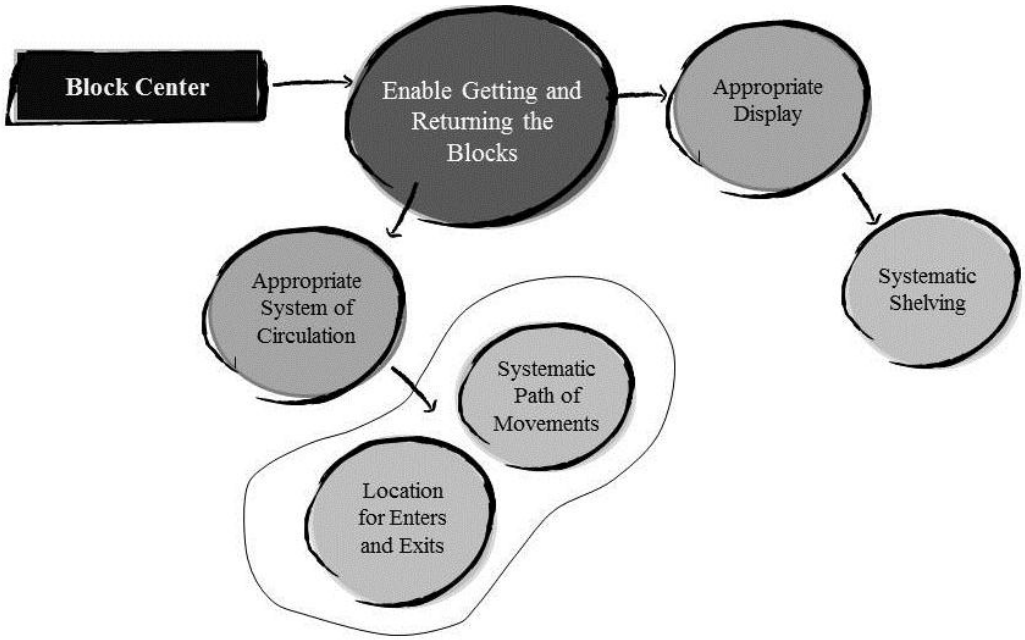


Figure 19. Design requirements and design characteristics that provides children's independent access to the blocks in preschool's block center

**2. Enhance the Process of Construction**

To support children's experience of constructing block structure it is organize this space properly. Locating this center is a suitable area of the setting, define its boundaries properly and leaving enough empty space based on the number of children are three main consideration in organizing this space. Second requirement of enhancing children's process of construction is providing their comfort during this experience. Design a soft and comfortable floor and provide comfortable seating units are two main features that support children to construct blocks in comfort.

Third requirement of enhancing children's process of construction is design an attractive space and using attractive design elements can provide this requirement. Final requirement of enhancing children's process of construction is enhancing teachers' collaboration with children in this center. Supporting teachers' physical and visual interaction in this area will respond to teachers' requirement of collaboration (Figure 20).

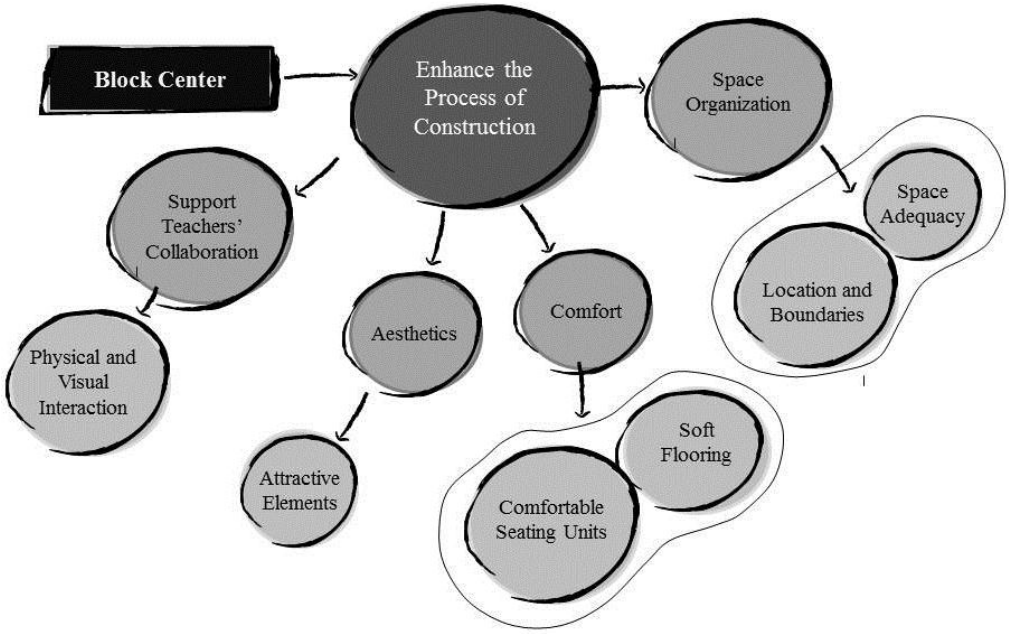


Figure 20. Design requirements and design characteristics enhance children's process of construction in preschool's dramatic play area

#### 4.1.1.7 Area for Music and Movement

Seventh category of 'developmental-based' learning experiences is block. As it was discussed in section 3.3.1.7, designing an appropriate layout for children's movement is the main design criteria that need to be considered in designing area that music and movement activities happens. Subsets of this criteria is as follow.

**1. Movement Oriented Layout**

A movement oriented layout requires an appropriate space organization. Locating this area, appropriate planning, leaving enough empty space and defining the appropriate boundaries of this area are necessary features to support this requirement in space. Second requirement of movement oriented layout is increase children's movement. Providing appropriate display and safe physical content are the features that will enhance the children's independent movement. Third requirement of children's independent movement is enhancing children's sensory experiences. Providing visual and kinesthetic items, using sound stimulators and increasing

children's tactile experiences are the features that will support children's sensory experiences (Figure 21).

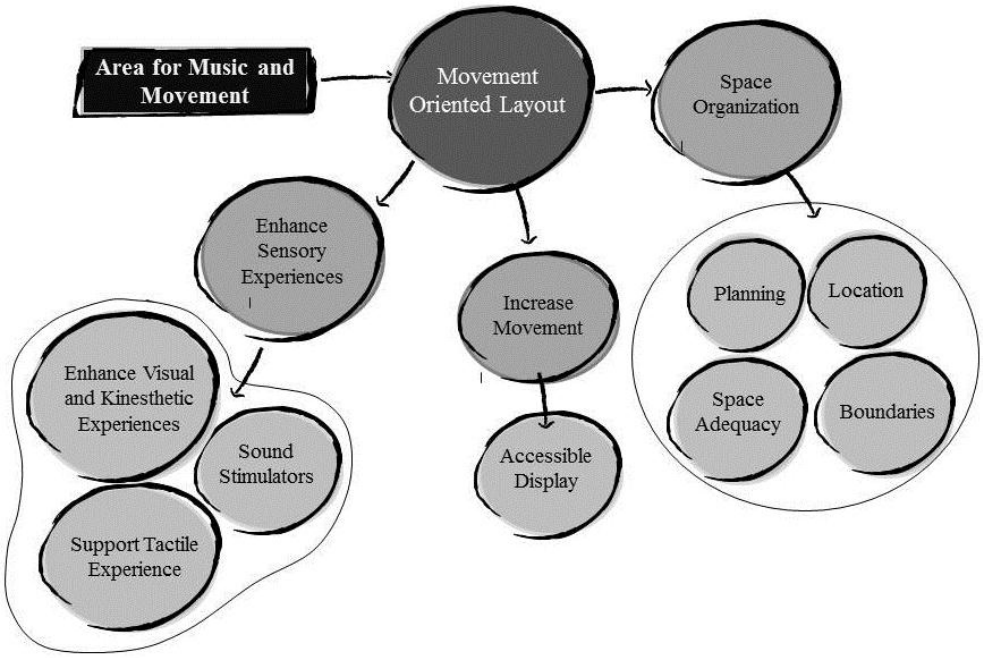


Figure 21. Design requirements and design characteristics that shape movement oriented layout of area for music and movement in preschools

#### 4.1.1.8 Gross Motor Area

Eighth category of 'developmental-based' learning experiences is gross motor activities. As it was discussed in section 3.3.1.8, providing support for children's physical activities is the main design criteria that need to be considered in designing gross motor area. Subsets of this criteria is as follow.

**1. Support for Physical Activities**

To support children's physical activities in gross motor area the main requirement is an appropriate space organization to support this criteria. Proper zoning of the space, leaving enough empty space, consider enough unoccupied space based on the available activities and shape a clear path of movement for children are the design features that will respond to this requirement. Second requirement of supporting children physical activities in gross motor area is providing a safe physical content

for children. Considering a safe circulation path, a safe floor covering and provide teachers' full visual and physical access to the overall environment will create a safe content for children's physical activities (Figure 22).

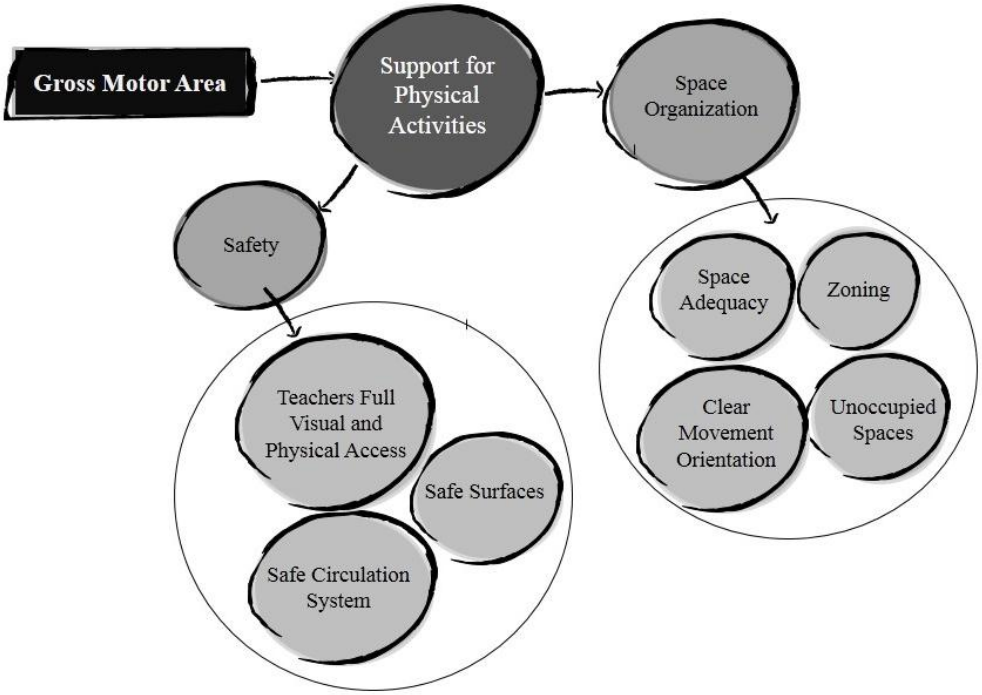


Figure 22. Design requirements and design characteristics that support children's physical activities in preschool's gross motor area

### 4.1.2 Taxonomy Analysis of Holistic Learning Experiences

Holistic learning experiences in preschools include experience of arrival and departure, cooking practice, dining and using the lavatories. Taxonomy analysis of these five categories is as follow.

#### 4.1.2.1 Spaces that Serve Arrival and Departure

First category of 'holistic' learning experiences is experience of arrival and departure. As it was discussed in section 3.3.2.1, providing influence of procession and creating a way finding entry and identical entrance from outside are the main criteria in supporting children and parents' arrival and departure. Provide identical visual and physical characters in entry hall are the main criteria to support arrival and

departure of children, parents and teachers inside the building. Subsets of these criteria are as follow.

**1. Influence of Procession**

The requirements of creating influence of precession is shaping a typological depth and designing variety of transitional spaces and patterns of transit in between street entry and building entry will shape this typological depth (Figure 23).

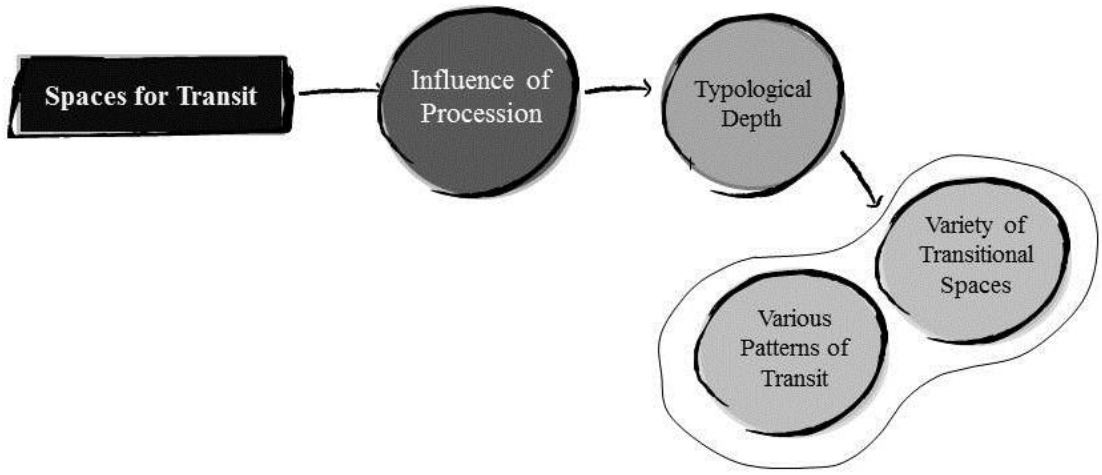


Figure 23. Design requirements and design characteristics that support process of arrival and departure in preschools' outdoor transitional spaces

**2. Way Finding Area**

Requirement of creating a way finding entry is designing an appropriate circulation network in between street entry and building entry. Visibility of the entrance, visibility of the boundaries of circulation paths and define a logical navigation are the features that need to be considered in order to shape a way finding entry (Figure 24).

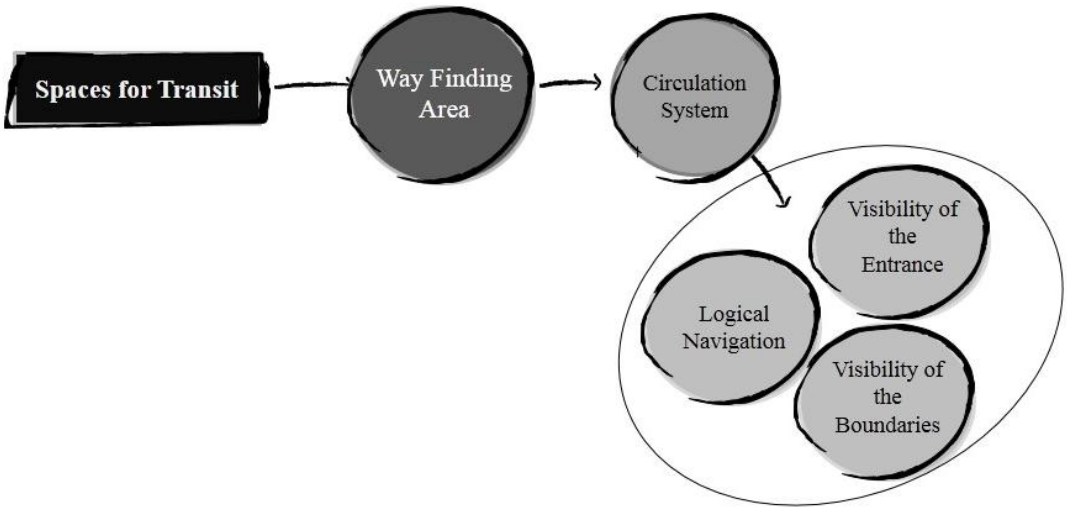


Figure 24. Design requirements and design characteristics that create a way finding entry during arrival and departure in preschools

**3. Identical Entrance**

Requirement for creating an identical entrance from the outside is shaping an identical character for the entry to the building. Identical form, unique visual scope, dominance and legibility of the entrance are the features that will support the identical character of the entry. Requirement for creating an identical entrance on the inside is shaping an identical entry hall. Designing and inviting entry hall, support visual security of children and parents in entry hall and create a calm entrance environment will support the identical character of the entry hall.

Another Requirement of an identical entrance in preschool is an identical physical character that supports patterns of arrival and departure. Designing a layout that encourage socialization, provide adequate space and furniture, appropriate orientation of the waiting space and necessary adjacencies and providing exciting opportunities in entry hall will support the physical character of the entrance space (Figure 25).

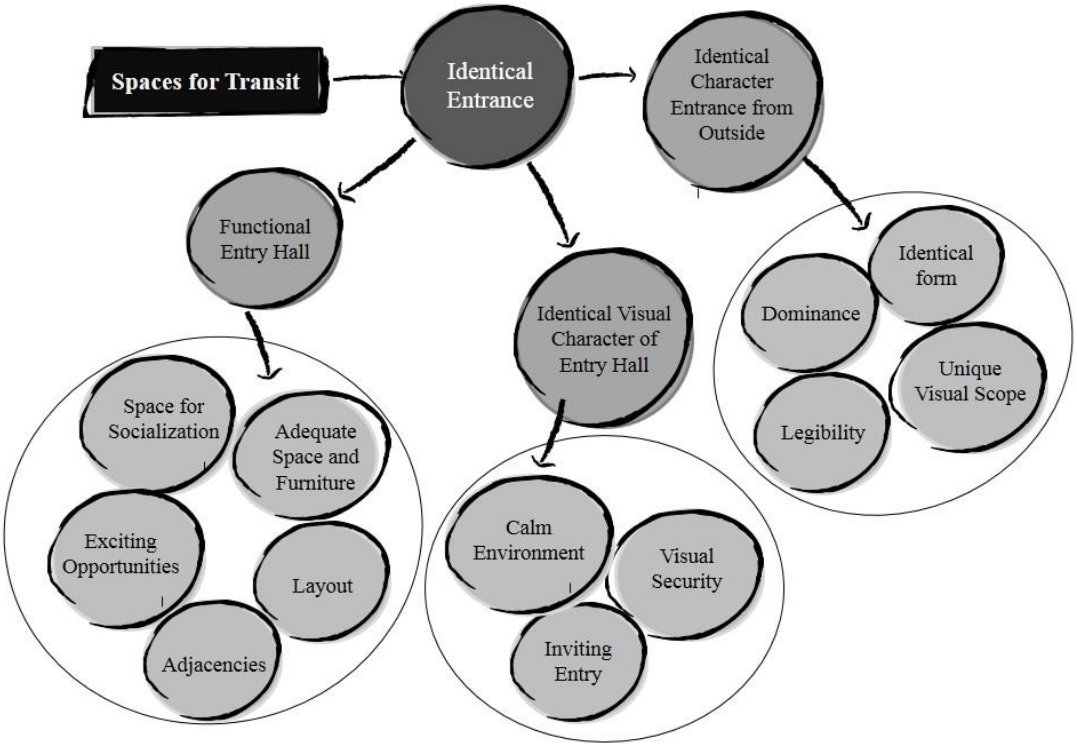


Figure 25. Design requirements and design characteristics that shape an identical entrance in preschools

#### 4.1.2.2 Kitchen

Second category of 'holistic' learning experiences is cooking experiences. As it was discussed in section 3.3.2.2, providing supports for children's cooking practice and social interaction are two main criteria that need to be considered in designing the kitchen that serves children's cooking experiences. Subsets of these criteria are as follow.

**1. Supports for Cooking Practice**

First requirement to support children's cooking experiences is provide children's free interaction in the space. Proper arrangement of working surfaces, defining an appropriate circulation network and support children's safety are three main considerations that will support children's free interaction in the kitchen. Second requirement of supporting children's cooking experiences is organization of the

space. Location of the kitchen, its visual link and necessary adjacencies are the items that need to be considered in organizing this space.

Third requirement of supporting children's cooking experiences is providing teachers' full supervision over the environment and this requirement needs providing teachers' comfortable movement and appropriate arrangement of the kitchen that allow teachers' full vision over the kitchen environment (Figure 26).

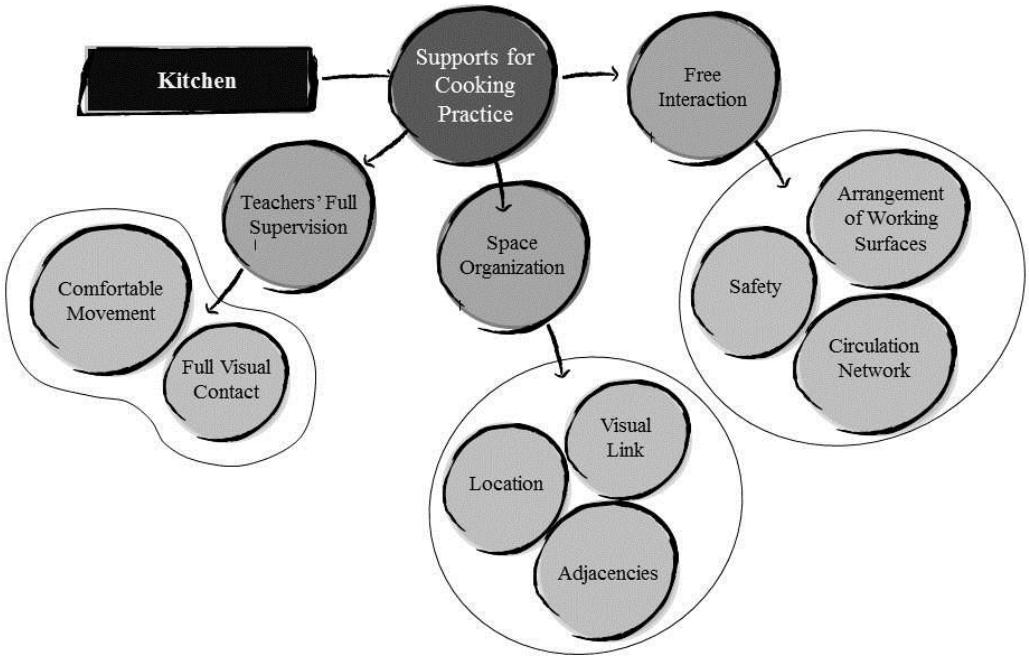


Figure 26. Design requirements and design characteristics that support children's cooking practice in preschools' kitchen

**2. Supports for Social Interactions**

To support children's social interaction during cooking experiences it is required to provide a layout that encourages communications. Appropriate arrangement of display units, shaping a design that encourage group oriented works and considering a space to exhibit children's products are the items that will design a layout for communication (Figure 27).

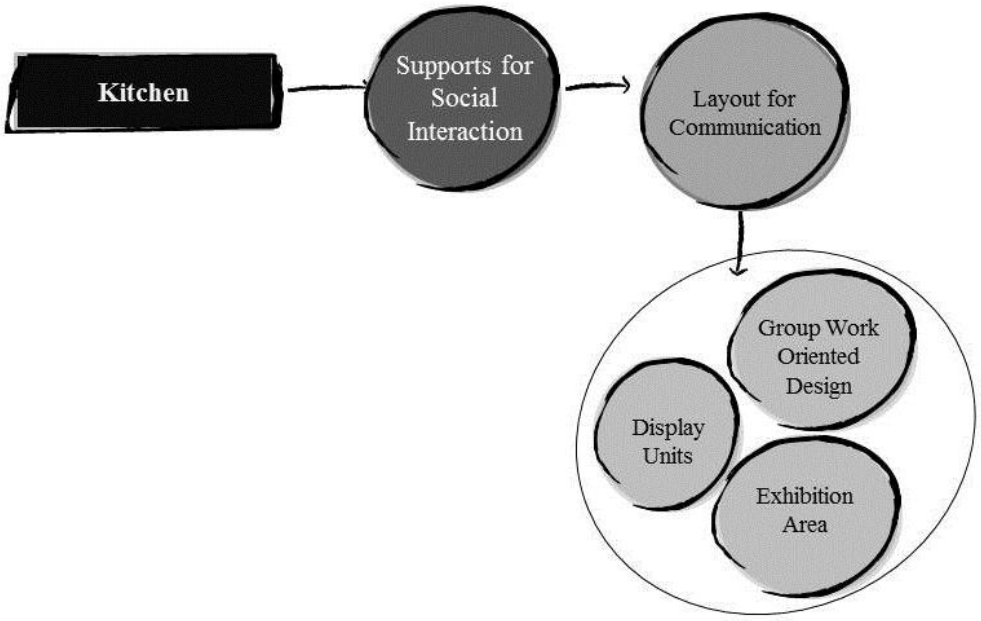


Figure 27. Design requirements and design characteristics that support social interaction during cooking experiences in preschools' kitchen

#### 4.1.2.3 Dining Area

Third category of 'holistic' learning experiences is cooking experiences. As it was discussed in section 3.3.2.3, designing a pleasant dining environment is the main criteria that need to be considered in designing the space that children and teachers use to have their meals. Subsets of this criteria are as follow.

**1. Pleasant Dining Environment**

Providing children and teachers' physical comfort is first requirement of designing a pleasant dining environment. Comfortable and flexible seating units, adequate space and providing a good acoustic, lighting and a fresh air quality are the design consideration that will support children and teachers' physical comfort.

Second requirement for designing a pleasant dining environment is providing a comfortable circulation. A well-designed traffic path, appropriate location of sitting elements and considering the necessary adjacencies are the features that are necessary to shape a comfortable circulation path in dining area. Identity is the third

requirement for designing a pleasant dining environment. Creating organizations and using unique furniture that represents culture of dining will create a unique identity in this space that emphasizes the culture of eating (Figure 28).

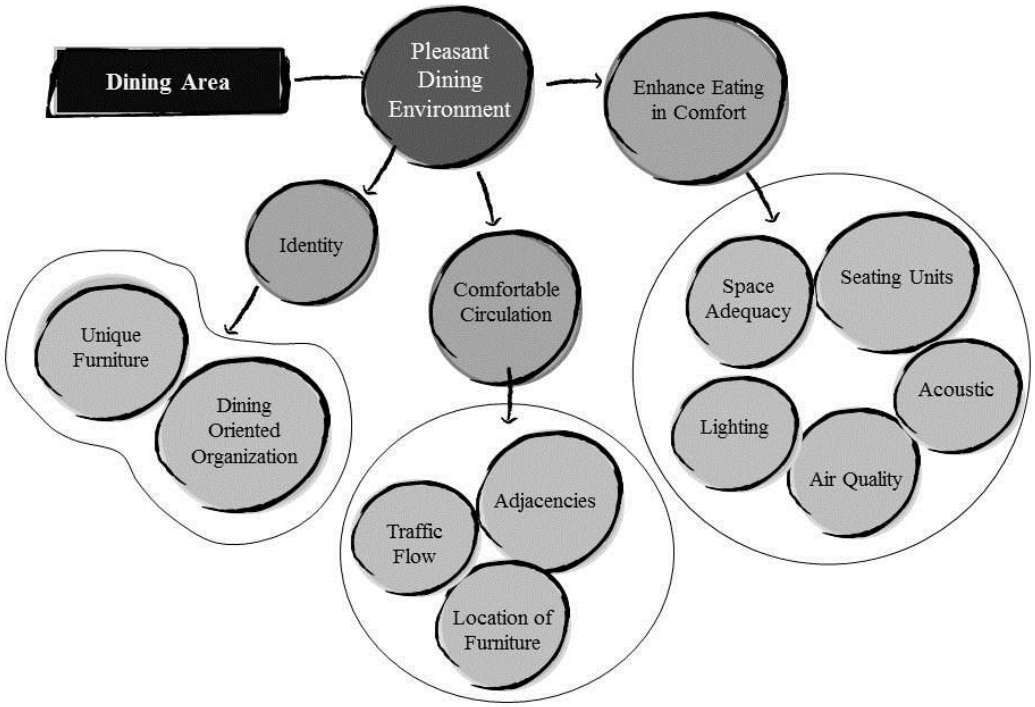


Figure 28. Design requirements and design characteristics that create pleasant ding environment for children and teachers in preschools' dining area

#### 4.1.2.4 Lavatory

Fourth category of 'holistic' learning experiences is toilet training. As it was discussed in section 3.3.2.4, supporting children's pleasant practice during using the lavatories is the main criteria that need to be considered in designing the lavatory spaces that children use. Subsets of this criteria are as follow.

**1. Support for a Pleasant Practice**

Supporting children's physical comfort during using the lavatories is the first requirement of a pleasant toilet practice. Appropriate scale of furniture and fixtures, using visual attractions and locating a practical storage in lavatories will enhance children's comfortable toilet training. Proper organization of the lavatory space is

another requirement of supporting children's pleasant practice during using lavatories. Central location of the lavatory, its necessary adjacencies, considering adequate space and considering teachers' line of sight to this area from main activity areas are the items that will enrich the quality of lavatory space organization. Last requirement of a children's pleasant toilet practice is providing their sense of security and privacy. Using low level partitions to divide the toilets can support children's sense of privacy during using this space (Figure 29).

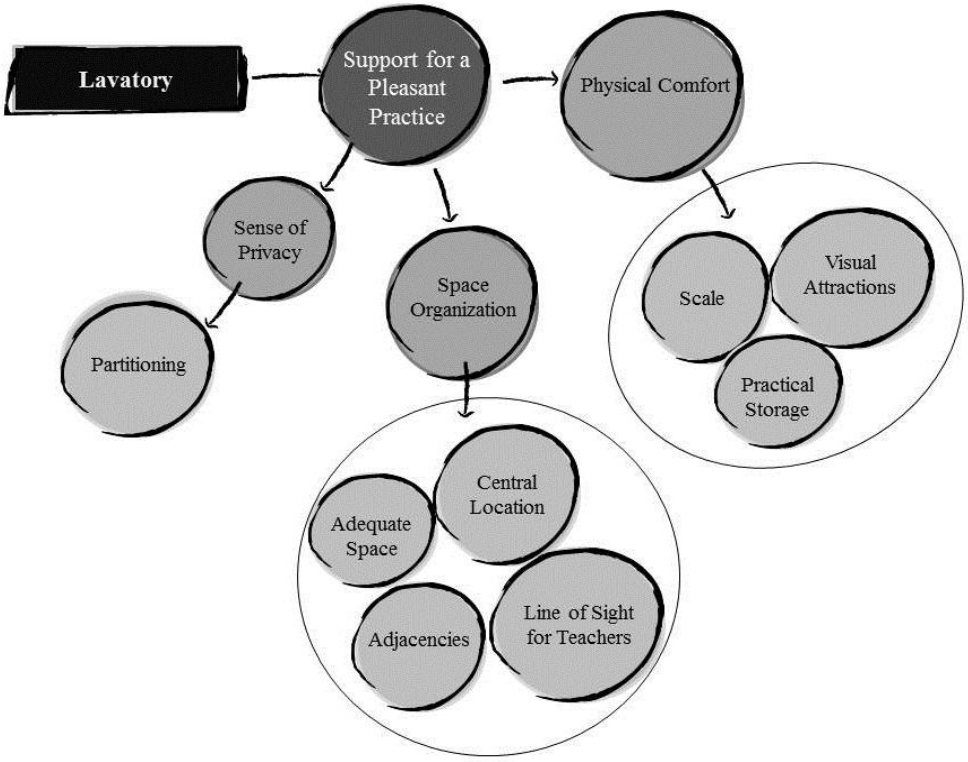


Figure 29. Design requirements and design characteristics that support children's toilet practice in preschools' lavatory

## 4.2 Methodology Guideline of the Model

Based on the main objective of this study, the methods that are necessary to be adopted by inspectors in evaluating the proposed items have to be capable of clarifying the usability of the design solutions for everyday learning routine. According to the international organization for standardization (ISO) usability of a

product can be defined as “The extent to which the products can be used by specified users to achieve specified goals in the specific context of use with the particular environment (ISO 9241-11, 1998)”. This definition addressed the exact expectations that are necessary to be considered during the evaluation proposed in current thesis. Each item need to be evaluated against the intended use by considering users and their intention of use in the particular environment.

Researchers such as Dumas and Salzman (2006) or Maguire (2001) have introduced methodologies that would be useful for evaluating the usability of the design products. However design and arrangement of interior space can be considered as a product, but the dynamic life within its environment takes this product to a more complicated dimensions and therefore using single evaluation methodology would not be enough for evaluating its usability. In this section, methodologies that need to be adopted during the evaluation procedure are identified and described in detail and further more they are rescheduled based on scope of evaluation of each item.

The main tools for recording the inclusive contextual observation, daily experience based interviews and design oriented analysis would be written narratives and field notes. This means that instead of rating the items, the strengths and weaknesses of item during the pre-defined experiences should be described and identified. Figure 7 shows the visual representation of the interior design quality analysis model’s methodology list.

### 4.2.1 Inclusive Contextual Observation

The first and the main method that will be adopted for evaluating the proposed design criteria is observation. The expected observation during current evaluation is the mix and match of three observation techniques and has been named as ‘Inclusive

Contextual Observation'. Inclusive contextual observation is the combination of structured observation, naturalistic observation and walk through observation. Inclusive contextual observation is accomplished through three main steps:

1. Observing children, teachers and parents (where they are participants) in their everyday context and evaluate the evaluation items by observing the sequences of events and activities within the physical context of space (Aubrey, David, Godfrey & Thompson, 2000, Mukherji & Albon, 2010).
2. Observing the way design and characteristics of the spaces responds to patterns of activities by focusing on users' actions during the everyday routine (Dunn, 2007, Goodwin, 2010, Mukherji & Albon, 2010).
3. Observing the activities in relation to the spatial-relationship and surrounding by analyzing the way design and arrangement of the space support users' movement and actions (Haruna, Hamida, Talibb and Rahimc, 2011).

### 4.2.2 Daily Experience Based Interview

The second technique that time to time will be necessary for inspectors to adopt for a better evaluation of items is interview. This technique becomes useful especially where the inspector is an outsider or where the observation would not be enough and only the experience of users through instant interaction with spaces will identify the strength or weakness of the items. The interview that is required for the currents' model of evaluation is called 'daily experience based interview' and it is shaped by combination of focused interview and experience sampling method. Daily routine experience based interview is accomplished by:

1. Interviewing users who were involved in a particular situation by focusing on a subjective experience of that person (the subject is the intended evaluation item) through a structured content (Merton, 2008).

2. Collect the respond of the interviewee(s) about the relationship between the intended item and his actions during a particular experience (Zirkel, Garcia & Murphy, 2015).

### 4.2.3 Design Oriented Analysis

The third method that will be necessary based on scope of evaluation of some of the items' is 'design oriented analysis'. This analysis is necessary where the design and arrangement of certain features (such as elements, furniture and fixtures) are the focus of evaluation and their design characteristics is considered to be a support for enhancing learning experiences. Design analysis is accomplished by evaluating the physical and visual characteristics of features in interior space based on pre-defined consideration.

In following section, the appropriate method that need to be adopted for evaluating the items for each criteria during each learning experience (category) will be identified and their content of evaluation will be defined parallel with the intention of evaluating the intended item.

## 4.3 Model's Evaluation Framework

Before locating the necessary evaluation methods in the models evaluation framework, the evaluation structure of 'inclusive contextual observation', 'daily experience based interview' and 'design oriented analysis' were classified as:

**1. Inclusive Contextual Observation:**

- Context: The Location and event(s) of observation
- Focus Group: The focus group(s) of observation
- Actions: The focus group patterns of actions

- Design oriented Support: The design characteristics that should be observed in terms of support they provide for focus group patterns of actions

**2. Daily Experience Based Interview:**

- Focus Group: Who person(s) who will be interviewed
- Subject of Experience: The intended pattern of experience for data collection
- Content of Question: Defining the interview structure by identifying the intended relationship between the particular design characteristics and interviewees actions during the subjective experience

**3. Design Oriented Analysis:**

- Focus: The element/feature that need to be analyzed
- Scope of Analysis: Dimensions of analysis

In following section based on the methodology that would be necessary to be used for evaluating each item will be selected from the methodologies above and their content of evaluation will be defined by referring to purpose of evaluating that item. Tables below represent the combination of subsets that is established in section 4.1 and necessary evaluation methodologies that inspectors need to follow in order to control the quality of these items in relation to patterns of learning experiences.

Table 5. Design quality evaluation model for interior space of preschool settings

| **LITERACY CENTER** | | | | | |
|---|---|---|---|---|---|
| **CRITERIA 1: Print Oriented Environment (The Design of space encourage children to be involved with print oriented activities)** | | | | | |
| **INDICATOR 1: Promote Print Related Activities** | | | | | |
| **ITEM 1: Display Units** | | | | | |
| Method 1: Design Oriented Analysis | | | Method 2: Inclusive Contextual Observation | | |
| Focus | Display units in literacy center | | Context | Literacy Center during print oriented activities | |
| Scope of Analysis | Are the design characteristics of displays inviting for children? | | Focus Group | Children | |
| | | | Actions | Full visual and physical access over the options | |
| | | | Design Oriented Support | Legible and accessible display of materials | |
| **ITEM 2: Systematic Adjacencies** | | | | | |
| Method 1: Design Oriented Analysis | | | | | |
| Focus | Spaces that offer print oriented activities/materials | | | | |
| Scope of Analysis | Are these areas located next to each other or in a close relationship with one another? | | | | |
| **INDICATOR 2: Supports for Positive Interaction** | | | | | |
| **ITEM 1: Seating Arrangememt** | | | | | |
| Method 1:Design Oriented Analysis | | | Method 2:Inclusive Contextual Observation | | Method 3:Daily Experience Based Interview |
| Focus | Seating alternatives in literacy center | | Context | Literacy Center | Focus Group | Children |
| Scope of Analysis | Are there varieties of seating options to support children's various position during reading/writing? | | Focus Group | Children | Subject of Experience | Comfortable sitting during print oriented activities |
| | | | Actions | Engage in solo and group activities | Content of Question | Do they feel comfortable? |
| | | | Design Oriented Support | Appropriate seating options | | |
| **ITEM 2: Lighting** | | | | | |
| Method 1: Design Oriented Analysis | | | Method 2: Daily Experience Based Interview | | |
| Focus | Amount of Lighting | | Focus Group | Teachers | |
| Scope of Analysis | Is task lighting available for individual experiences? Are there enough natural lighting? Do all the spots get enough light? | | Subject of Experience | Decent sight during print oriented activities | |
| | | | Content of Question | Do they have enough light in literacy center during the day | |

| **ITEM 3: Circulation** | | | |
|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Inclusive Contextual Observation | |
| Focus | System of circulation paths | Context | Literacy Center during print oriented activities |
| | | Focus Group | Children |
| Scope of Analysis | Do the paths navigate children to the activities, materials and options? | Actions | Free flow between the areas and displays |
| | | Design Oriented Support | Sufficient amount of circulation space |

| **ITEM 4: Computing Zone** | | | |
|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Daily Experience Based Interview | |
| Focus | Availability of a zone that offer digital reading | Focus Group | Teachers |
| | | Subject of Experience | Children’s interaction with computers |
| Scope of Analysis | Is the zone accessibility and legibility for children? | Content of Question | Do they have a full vision over the computing zone from anywhere in literacy center? |

| **ITEM 5: Teachers Friendly Arrangement** | | | | | |
|---|---|---|---|---|---|
| Method 1: Daily Experience Based Interview | | Method 2: Daily Experience Based Interview | | Method 3: Inclusive Contextual Observation | |
| Focus Group | Teachers | Focus Group | Teachers | Context | Literacy Center during print oriented activities |
| Subject of Experience | Teacher’s visual and physical access to children | Subject of Experience | Rearranging the literacy center | Focus Group | Teachers |
| Content of Question | Does the design and arrangement of space allow them to see and rich all the children immediately? | Content of Question | Do the furniture typology and layout allow them to rearrange the space based on different strategies? | Actions | Comfortable movement |
| | | | | Design Oriented Support | Sufficient amount of empty space |

**CRITERIA 2: Linguistic Oriented Environment (The Design and arrangement of the space encourage children to be involved with print oriented activities)**

**INDICATOR 1: Promote Linguistic Related Activities**

| **ITEM 1: Display Units** | | | |
|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Inclusive Contextual Observation | |
| Focus | Display units of linguistic materials in literacy center | Context | Literacy Center during print oriented activities |
| | | Focus Group | Children |
| Scope of Analysis | Are the design characteristics of displays inviting for children? | Actions | Full visual and physical access over the options |
| | | Design Oriented Support | Legible and accessible display of materials |

| **ITEM 2: Social Seating Arrangements** | |
|---|---|
| Method 1: Inclusive Contextual Observation | |
| Context | Literacy Center during linguistic activities |
| Focus Group | Children and teachers |
| Actions | Group cooperation and increase in eye contact with peers |
| Design Oriented Support | Circular and group seating arrangement |

**INDICATOR 2: Supports for Linguistic Skills**

| **ITEM 1: Practical Layout** | | | |
|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Inclusive Contextual Observation | |
| Focus | Space arrangement during storytelling | Context | Literacy Center during listening and singing |
| Scope of Analysis | Enough empty space for gathering during storytelling. Accessible display for storytelling materials close to the gathering space | Focus Group | Children |
| | | Actions | Engage in solo and group activities |
| | | Design Oriented Support | Private and open areas |

| **ITEM 2: Acoustical Solutions** | |
|---|---|
| Method 1: Inclusive Contextual Observation | |
| Context | Literacy Center during linguistic activities |
| Focus Group | Children and teachers |
| Actions | Verbal communication |
| Design Oriented Support | Barriers to reduce the noise and prevent echo to create an acoustically appropriate environment for socialization |

**ART CENTER**

**CRITERIA 1: Space for Experiencing the Process(The Design and arrangement of the space encourage children to experience doing art)**

**INDICATOR 1: Inspiring Environment**

| **ITEM 1: Flexible Layout** | | | |
|---|---|---|---|
| Method 1: Inclusive Contextual Observation | | Method 2: Daily Experience Based Interview | |
| Context | Literacy Center during listening and singing | Focus Group | Teachers |
| Focus Group | Children | Subject of Experience | Rearranging the layout/furniture arrangement |
| Actions | Engage in solo and group activities | Content of Question | Do they have the possibility to create different working layouts for children based on requirement of various art activities? |
| Design Oriented Support | Private and open areas | | |

| **ITEM 2: Display Units** | | | | | |
|---|---|---|---|---|---|
| Method 1:Design Oriented Analysis | | Method 2:Design Oriented Analysis | | Method 3:Inclusive Contextual Observation | |
| Focus | Display units for art materials | Focus | Display units for art products by children or artists | Context | Art center during art activities |
| | | | | Focus Group | Children |
| Scope of Analysis | Inviting design characteristics | Scope of Analysis | Inviting design characteristics. Children visit their location during the day. Design prevent children to do further changes on the product. | Actions | Full visual and physical access over the options |
| | | | | Design Oriented Support | Accessible and legible display |

**INDICATOR 2: Supports for Free Art Performance**

| **ITEM 1: Safety** | | | | | |
|---|---|---|---|---|---|
| Method 1:Design Oriented Analysis | | Method 2:Inclusive Contextual Observation | | Method 3:Daily Experience Based Interview | |
| Focus | Art center | Context | Art center during children's free exploration | Focus Group | Teachers |
| | | Focus Group | Children and teachers | Subject of Experience | Children's free art exploration |
| Scope of Analysis | Space is free of sharp edges and pointed element | Actions | Movement | Content of Question | Do they have full visual and physical access to all children in any spot of the center? (State the undercover spots) |
| | | Design Oriented Support | Safe circulation network | | |

| **ITEM 2: Comfort** | | | |
|---|---|---|---|
| Method 1: Inclusive Contextual Observation | | Method 2: Daily Experience Based Interview | |
| Context | Art center during children's art activities | Focus Group | Children |
| Focus Group | Children | Subject of Experience | Children's comfortable sitting |
| Actions | Using the surfaces for doing art | Content of Question | Do they feel comfortable while using seating units during art activities? |
| Design Oriented Support | Enough amount of surface for all the children | | |

| **ITEM 3: Various Seating Options** | |
|---|---|
| Method 1:Design Oriented Analysis | |
| Focus | Art center |
| Scope of Analysis | Space is free of sharp edges and pointed element |

| ITEM 4: Lighting | | | |
|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Daily Experience Based Interview | |
| Focus | Appropriate Lighting | Focus Group | Children |
| Scope of Analysis | Task lighting is available for individual experiences and overhead lighting for group activities. Space gets enough natural light. | Subject of Experience | Good sight during art activities |
| | | Content of Question | Do they have enough light in literacy center during the day? If not state the times problems. |

| ITEM 5: Hygiene Oriented Consideration | | | |
|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Daily Experience Based Interview | |
| Focus | Water source | Focus Group | Teachers |
| Scope of Analysis | There is a source of water somewhere close to the art center that provide children's comfortable access during art activities | Subject of Experience | Cleaning the surfaces |
| | | Content of Question | Do the surface materials allow them to clean the surfaces easily? |

**MATH CENTER**

**CRITERIA 1: Space for Manipulation (The Design and arrangement of the space encourage children to be manipulative)**

**INDICATOR 1: Accessibility and Visibility of Options**

| ITEM 1:Appropriate Display | | | |
|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Inclusive Contextual Observation | |
| Focus | Vertical surfaces and elements that are dedicated to display the math oriented visual materials | Context | Math center during math activities |
| Scope of Analysis | Visible location from anywhere in the math center | Focus Group | Children |
| | | Actions | Full visual and physical access over all the options |
| | | Design Oriented Support | Accessible and legible display |

**INDICATOR 2: Children's Free Exploration**

| ITEM 2: Safe Interaction | | | |
|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Inclusive Contextual Observation | |
| Focus | Math center | Context | Math center during math activities |
| Scope of Analysis | Space is free of sharp edges and pointed elements | Focus Group | Children |
| | | Actions | Free and safe movement and interaction |
| | | Design Oriented Support | Space free of sharp edges and pointed element and sufficient empty space for circulation |

| **ITEM 3: Various Seating Options** | |
|---|---|
| | |
| Context | Math center during math activities |
| Focus Group | Children |
| Actions | Individual and group activities |
| Design Oriented Support | Sitting alternatives for solo and group activities |

**INDICATOR 3: Teachers' Comfortable Interaction**

| **ITEM 1: Teachers' Visual Interaction** | |
|---|---|
| | |
| Focus Group | Teachers |
| Subject of Experience | Full observation |
| Content of Question | Does the arrangement of the space allow them to have a full vision over all the children in any spot in the center? |

| **ITEM 2: Teachers' Comfortable Participation** | | | |
|---|---|---|---|
| Method 1: Inclusive Contextual Observation | | Method 2: Daily Experience Based Interview | |
| Context | Math center during math activities | Focus Group | Teachers |
| Focus Group | Teachers | Subject of Experience | Participation in math activities with children |
| Actions | Movement | Content of Question | Do they feel comfortable while they engage in activities with children? |
| Design Oriented Support | Sufficient circulation area | | |

| **ITEM 3: Flexibile Layout** | | | |
|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Daily Experience Based Interview | |
| Focus | Modified open space | Focus Group | Teachers |
| Scope of Analysis | The math center include both open and close spaces | Subject of Experience | Rearrangement of the space |
| | | Content of Question | Does the layout of the space allow them to create different situation based on their intended strategies? |

| CRITERIA 2: Space for Social Engagement (The Design and arrangement of the space increase socialization) | | | |
|---|---|---|---|
| **INDICATOR 1: Supports for Socialization** | | | |
| **ITEM 1: Computer Zone** | | | |
| Method 1: Design Oriented Analysis | | Method 2: Daily Experience Based Interview | |
| Focus | Availability of a zone that offer digital devices | Focus Group | Teachers |
| Scope of Analysis | Sitting arrangement that allow children sit side by side | Subject of Experience | Children's interaction with computers |
| | | Content of Question | Do they have a full vision over the computing zone from anywhere in literacy center? |
| **ITEM 2: Layout for Group Interaction`** | | | |
| Method 1: Inclusive Contextual Observation | | | |
| Context | Math center during discussions | | |
| Focus Group | Children and teachers | | |
| Actions | Communication | | |
| Design Oriented Support | Sitting arrangement enhance group cooperation and eye contact | | |
| **ITEM 3: Acoustical Solutions** | | | |
| Method 1: Inclusive Contextual Observation | | | |
| Context | Math center during discussions and socialization | | |
| Focus Group | Children and teachers | | |
| Actions | Verbal communication | | |
| Design Oriented Support | Do noise barriers reduce the noise and prevent echo? Is the environment acoustically appropriate for socialization? | | |
| **SIENCE CENTER** | | | |
| **CRITERIA 1: Interactive Space (The Design and arrangement of the space encourage children to be sensually involved with the opportunities)** | | | |
| **INDICATOR 1: Visibility of Options and Materials** | | | |
| **ITEM 1:Display** | | | |
| Method 1: Design Oriented Analysis | | Method 2: Inclusive Contextual Observation | |
| Focus | Surfaces for displaying science oriented visuals | Context | Science center during science exploration |
| Scope of Analysis | Location of these elements allow children to see the visuals from anywhere in the science center | Focus Group | Children<br>Full visual and physical access over all the options |
| | | Actions | Attractive, accessible and legible display |
| | | Design Oriented Support | Science center during science exploration |

| **ITEM 3: Sensory Table** | |
|---|---|
| Method 1: Inclusive Contextual Observation | |
| Context | Science center during science exploration |
| Focus Group | Children |
| Actions | Children’s comfortable interaction with the materials |
| Design Oriented Support | Appropriate scale, location and orientation of sensory table |

**INDICATOR 2: Sensory Oriented Design**

| **ITEM 1: Traffic Paths** | |
|---|---|
| Method 1:Design Oriented Analysis | |
| Focus | Circulation network |
| Scope of Analysis | Well-defined paths in between displays and areas |

| **ITEM 2: Safe and Independent Access** | |
|---|---|
| Method 1: Inclusive Contextual Observation | |
| Context | Science center during science exploration |
| Focus Group | Children and teachers |
| Actions | Safe accessibility of children to materials |
| Design Oriented Support | Safe display |

| **ITEM 3: Space Adequacy** | |
|---|---|
| Method 1: Inclusive Contextual Observation | |
| Context | Science center during science exploration |
| Focus Group | Children and teachers |
| Actions | Free movement of all the children |
| Design Oriented Support | Sufficient amount of empty space |

| **ITEM 4: Visual Stimulation** | |
|---|---|
| Method 1:Design Oriented Analysis | |
| Focus | Visual stimulator |
| Scope of Analysis | Features that stimulate the sense of sight |

| **ITEM 5: Stimulate Curiosity** | |
|---|---|
| Method 1: Daily Experience Based Interview | |
| Focus Group | Teachers |
| Subject of Experience | Creating new situations |
| Content of Question | Do they have the chance to create new layouts based on requirements of new experiments? |

**INDICATOR 3: Visibility of Options and Materials**

| **ITEM 1:Location** | |
|---|---|
| Method 1:Design Oriented Analysis | |
| Focus | Location of science center |
| Scope of Analysis | Adjacency with window/outdoor |

| **ITEM 2: Explanatory Zone** | |
|---|---|
| Method 1: Inclusive Contextual Observation | |
| Context | Science center during science exploration |
| Focus Group | Children and teachers |
| Actions | Small group and individual Exploration |
| Design Oriented Support | Arrangement for solo and small group activities |

| **ITEM 3: Discussion Zone** | |
|---|---|
| Method 1:Design Oriented Analysis | |
| Focus | Sitting arrangement for discussion |
| Scope of Analysis | Circular and semicircular arrangement that increase eye contact |

**CRITERIA 2: Supportive Space for Teacher (The Design and arrangement of space enhance teacher to facilitate the activities the opportunities)**

**INDICATOR 1: Teachers' Interaction**

| **ITEM 1:Circulation Network** | |
|---|---|
| Focus Group | Teachers |
| Subject of Experience | Movement in between areas and displays |
| Content of Question | Do they move in comfort in the center? |

| | |
|---|---|
| **ITEM 2: Teachers' Full Visual Contact** | |
| Focus Group | Teachers |
| Subject of Experience | Full visual access over children |
| Content of Question | Do they have full vision over all the children in any spot of the space? |
| **ITEM 3: Teachers' Comfortable Participation** | |
| Focus Group | Teachers |
| Subject of Experience | Comfortable participation in activities |
| Content of Question | Does the design and arrangement of furniture provide their comfortable participation in activities? |
| **DRAMATIC PLAY AREA** | |
| **CRITERIA 1: Space for Sharing and Communication (The Design and arrangement of the space encourage children to be social and cooperative)** | |
| **INDICATOR 1: Space Organization** | |
| **ITEM 1:Location** | |
| Method 1:Design Oriented Analysis | |
| Focus | Dramatic play area location |
| Scope of Analysis | Area is located somewhere far from the quiet zone(s) |
| **ITEM 2: Well-Define Boundaries** | |
| Focus | Areas within the dramatic play center |
| Scope of Analysis | The boundaries of these areas are defined visually and physically |
| **ITEM 3: Supportive Zoning** | |
| Focus | Areas within the dramatic play center |
| Scope of Analysis | Dramatic play area includes well-defined storage, empty spaces to work as stage for enacted roles and area that offer costumes and dress-up |
| **ITEM 4: Adequate Space** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Dramatic play area during role plays |
| Focus Group | Children |
| Actions | Movement and play |
| Design Oriented Support | Sufficient space and appropriate furniture arrangement for safe interaction |

**CRITERIA 2: Space to Create Pretend Role (The Design and arrangement of the space encourage children to be involved in creatıng role plays)**

**INDICATOR 1: Layout that Evoke Dramatization**

| **ITEM 1:Adjacencies** | |
|---|---|
| Method 1:Design Oriented Analysis | |
| Focus | Physical link between dramatic play area and other areas |
| Scope of Analysis | Dramatic play area is adjacent with activity areas and outdoor |

| **ITEM 2: Circulation System** | | | |
|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Inclusive Contextual Observation | |
| Focus | Arrangement of circulation paths | Context | Dramatic play area during movement |
| Scope of Analysis | Location of the areas and definition of circulation paths create a logical navigation within the area | Focus Group | Children |
| | | Actions | Movement |
| | | Design Oriented Support | The circulation system allows all the children to reach the existing options in comfort |

| **ITEM 3: Plotting Out Iconic Features** | | | |
|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Daily Experience Based Interview | |
| Focus | Dramatic play oriented physical features | Focus Group | Teachers |
| Scope of Analysis | Dramatic play area include iconic features that would identify the dramatic play | Subject of Experience | Distinguishing the design characteristics of dramatic play area |
| | | Content of Question | Do they define the experience by mentioning design characteristics of the space? what are those characteristics |

| **ITEM 4: Display** | |
|---|---|
| Method 1: Design Oriented Analysis | |
| Focus | Elements that stimulate sensory experiences |
| Scope of Analysis | There are design solutions that engage children in tactile experience tactile experience |

| **ITEM 5: Sensory Oriented Features** | | | | | |
|---|---|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Design Oriented Analysis | | Method 3: Daily Experience Based Interview | |
| Focus | Dramatic play oriented physical features | Focus | Display categorization of role play materials | Focus Group | Teachers |
| Scope of Analysis | Dramatic play area include iconic features that would identify the dramatic play | Scope of Analysis | Displays offer separate display for low-realism and realism materials | Subject of Experience | Distinguishing the design characteristics of dramatic play area |
| | | | | Content of Question | Do they define the experience by mentioning design characteristics of the space? what are those characteristics |

**INDICATOR 2: Supports for Procedure of Role Play**

| **ITEM 1:Mirror** | |
|---|---|
| Method 1: Inclusive Contextual Observation | |
| Context | Dramatic play area during role plays |
| Focus Group | Children |
| Actions | Standing/pretending in front of the mirror |
| Design Oriented Support | Location and scale of the mirror allow all the children to see themselves(especially during the dress up) |

| **ITEM 2: Planning** | | | |
|---|---|---|---|
| Method 1: Daily Experience Inclusive Contextual Observation | | Method 2: Inclusive Contextual Observation | |
| Context | Dramatic play area during play | Context | Dramatic play area during play |
| Focus Group | Children | Focus Group | Children |
| Actions | Create stage(s) for role plays | Actions | Access to role play materials |
| Design Oriented Support | There is sufficient empty space for all children to create their role play situations | Design Oriented Support | Role play materials are displayed somewhere close to the spaces that is used as children stage of act |

**INDICATOR 3: Space that Increases Teachers' Intervention**

| **ITEM 1:Supervision** | |
|---|---|
| Focus Group | Teachers |
| Subject of Experience | Setting up new themes |
| Content of Question | Does the layout of the area allow them to set up new themes and situation in comfort? |

| **ITEM :Well-Designed Storage** | | | |
|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Daily Experience Based Interview | |
| Focus | Storage that include storytelling and role play materials | Focus Group | Teachers |
| Scope of Analysis | Storage is located somewhere that children can have easy and quick access from the dramatic play area | Subject of Experience | Using the storage in dramatic play area |
| | | Content of Question | Do they think the location and design of this storage is functional for their daily use? |

**BLOCK CENTER**

**CRITERIA 1: Enable Get and Return (The Design and arrangement of space allow children to get and return the blocks independently)**

**INDICATOR 1: Display**

**ITEM 1:Systematic Shelving**

| Method 1: Design Oriented Analysis | |
|---|---|
| Focus | Display of blocks |
| Scope of Analysis | Blocks are displayed by shelves. Display units offer classified display based on type and scale of the blocks. |

| Method 2: Design Oriented Analysis | |
|---|---|
| Focus | Shelves that display blocks |
| Scope of Analysis | Shelves are numbered in a legible manner.<br>Shelves that display large blocks are placed lower than children's height. |

| Method 3: Inclusive Contextual Observation | |
|---|---|
| Context | Block center |
| Focus Group | Children |
| Actions | Visual and physical access to all the blocks |
| Design Oriented Support | Children see and reach all the blocks independently |

**INDICATOR 2: Appropriate System of Circulation**

**ITEM 1: Systematic paths of movements**

| Method 1: Inclusive Contextual Observation | |
|---|---|
| Context | Block center during constructing block structure |
| Focus Group | Children |
| Actions | Access to the  materials and displays |
| Design Oriented Support | The system of circulation path that lead children to displays prevent them to cross other children's play area |

**ITEM 2: Location of Exits and Enters**

| Method 1: Inclusive Contextual Observation | |
|---|---|
| Context | Block center during constructing block structure |
| Focus Group | Children |
| Actions | Entry and exit to the block center |
| Design Oriented Support | The location of the area's entry and exits prevent children who to cross children's play area when they enter or exit |

**CRITERIA 2: Enhance the Process of Construction (The Design and arrangement of space support children's block construction)**

**INDICATOR 1: Space Organization**

**ITEM 1: Location and Boundaries**

| Method 1: Design Oriented Analysis | |
|---|---|
| Focus | Location of block area |
| Scope of Analysis | It is located away from the quiet zone(s) |

| Method 2: Design Oriented Analysis | |
|---|---|
| Focus | Boundaries of block area |
| Scope of Analysis | It is enclosed from three sides |

| Method 3: Inclusive Contextual Observation | |
|---|---|
| Context | Block center during block oriented activities |
| Focus Group | Children, teachers and staff |
| Actions | Play with blocks |
| Design Oriented Support | The area is located away from the daily traffic |

**ITEM 2: Space Adequacy**

Method 1: Inclusive Contextual Observation

| | |
|---|---|
| Context | Block center during block oriented activities |
| Focus Group | Children |
| Actions | Secure and free play with blocks |
| Design Oriented Support | There is enough empty space for all children to spread their blocks, extend their structure and play in groups |

**INDICATOR 2: Comfort**

**ITEM 1: Soft Flooring**

| Method 1: Design Oriented Analysis | |
|---|---|
| Focus | Floor |
| Scope of Analysis | It is covered by soft and comfortable material |

| Method 2: Daily Experience Based Interview | |
|---|---|
| Focus Group | Children |
| Subject of Experience | Playing on the floor |
| Content of Question | Do they feel comfortable while seated? |

**ITEM 2: Seating Units**

Method 1: Design Oriented Analysis

| | |
|---|---|
| Focus | Child-scaled sitting units |
| Scope of Analysis | If Legos are available, there are sufficient chairs and tables based on the number of children |

**INDICATOR 3: Aesthetics**

| **ITEM 1: Attractive Elements** | | | |
|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Daily Experience Based Interview | |
| Focus | Attractive design characteristics and visuals | Focus Group | Children |
| Scope of Analysis | The area is identified by specific design characteristics and visual materials | Subject of Experience | Describing the block area |
| | | Content of Question | What are the features that excite them in block center? State the features that are related to the design |

**INDICATOR 4: Support Teachers' Collaboration**

| **ITEM 1: Physical and Visual Interaction** | |
|---|---|
| Method 1: Daily Experience Based Interview | |
| Focus Group | Teachers |
| Subject of Experience | Observing all the children and participation in block activities |
| Content of Question | Does the arrangement of the area allow them to see all the children and follow their process? State the areas that are not undercover. Do they feel comfortable while participating in children's activities? |

**AREA FOR MUSIC AND MOVEMENT**

**CRITERIA 1: Movement Oriented Layout (The Design and arrangement of space increase and encourage children's movement)**

**INDICATOR 1: Space Organization**

| **ITEM 1: Location** | |
|---|---|
| Method 1: Design Oriented Analysis | |
| Focus | Location of the movement and music center |
| Scope of Analysis | Area is located far from the noisy area |

| **ITEM 2: Planning** | |
|---|---|
| Method 1: Inclusive Contextual Observation | |
| Context | Music and movement area |
| Focus Group | Children |
| Actions | Movement |
| Design Oriented Support | The location of furniture and elements leave enough empty space in the middle for all children's safe and free movement patterns |

| **ITEM 3: Adequate Space** | |
|---|---|
| Method 1: Inclusive Contextual Observation | |
| Context | Music and movement area |
| Focus Group | Children |
| Actions | Movement |
| Design Oriented Support | The amount of empty space prevent children to interfere other' personal space during the activities |
| **ITEM 4: Boundaries** | |
| Method 1: Design Oriented Analysis | |
| Focus | Boundaries of music and movement area |
| Scope of Analysis | The boundaries are defined physically and visually |

**INDICATOR 2: Increase Movement**

| **ITEM 1: Accessible Display** | |
|---|---|
| Method 1: Daily Experience Based Interview | |
| Context | Music and movement area |
| Focus Group | Children |
| Actions | Get and return the materials |
| Design Oriented Support | Design, location and scale of the displays allow children to get and return the materials |

**INDICATOR 3: Enhance Sensory Experience**

| **ITEM 1: Enhance Visual and Kinesthetic Experiences** | | | |
|---|---|---|---|
| Method 1: Design Oriented Analysis | | Method 2: Design Oriented Analysis | |
| Focus | Location and the scale of mirror | Focus | Visual stimulator |
| Scope of Analysis | The location and scale of mirror allow children to see their motions in the mirror | Scope of Analysis | There are visualizers or elements that stimulate children's vision through the beats |

| | |
|---|---|
| **ITEM 2: Sound Stimulators** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Music and movement area |
| Focus Group | Children and teachers |
| Actions | Movement with music |
| Design Oriented Support | The acoustical solutions and sound system offer a quality music design |
| **ITEM 3: Support Tactile Experience** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Music and movement area |
| Focus Group | Children |
| Actions | Movement with music |
| Design Oriented Support | There are variety of surface materials to stimulate children's tactile experience during their movements |

**GROSS MOTOR AREA**

**CRITERIA 1: Support Physical Activities (The Design and arrangement of the space support children's movement and physical activities)**

**INDICATOR 1: Space Organization**

| | |
|---|---|
| **ITEM 1: Zoning** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Motor activity area during gross motor activities |
| Focus Group | Children |
| Actions | Movement |
| Design Oriented Support | There are stations that offer walking, running, galloping, jumping, hopping pad, leaping, balancing, stretching, throwing, catching and climbing skills |
| **ITEM 2: Adequate Space** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Motor activity area during gross motor activities |
| Focus Group | Children |
| Actions | Movement |
| Design Oriented Support | There is enough space based on the type of activities motor center offer |

| **ITEM 3: Unoccupied Space** | |
|---|---|
| Method 1: Inclusive Contextual Observation | |
| Context | Motor activity area during gross motor activities |
| Focus Group | Children |
| Actions | Spontaneous physical activities |
| Design Oriented Support | The center offer sufficient unoccupied space for children’s spontaneous physical activities |
| **ITEM 4: Clear Movement Orientation** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Motor activity area during gross motor activities |
| Focus Group | Children |
| Actions | Reaching the activities and items |
| Design Oriented Support | Boundaries and organization of the circulation paths guide children to the available items |
| **INDICATOR 2: Safety** | |
| **ITEM 1: Safe Circulation System** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Motor activity area during gross motor activities |
| Focus Group | Children |
| Actions | Reaching the activities and items |
| Design Oriented Support | Space provide children a safe circulation |
| **ITEM 2: Floor Covering** | |
| Method 1: Design Oriented Analysis | |
| Focus | Floor covering |
| Scope of Analysis | Floor is covered with materials that prevent children to slip during their movement |
| **ITEM 3: Teachers’ Full Physical and Visual Access** | |
| Method 1: Daily Experience Based Interview | |
| Focus Group | Teachers |
| Subject of Experience | Full observation |
| Content of Question | Does the arrangement of the spaces allow them to have a full vision over all the children in any spot in the center or reach them easily? State the areas that are not undercover. |

| SPACES FOR TRANSIT | |
|---|---|
| **CRITERIA 1: Influence of Procession (Design and arrangement of spaces for arrival/departure allow children to feel the process of transit)** | |
| **INDICATOR 1: Typological Depth** | |
| **ITEM 1: Variety of Transitional Spaces** | |
| Method 1: Design Oriented Analysis | |
| Focus | Transitional spaces between entry from the street and the building's entry |
| Scope of Analysis | Children will pass through variety of spaces before they enter the preschool building. Identify the transitional spaces. |
| **ITEM 2: Various Patterns of Transit** | |
| Method 1: Design Oriented Analysis | |
| Focus | Path between entry from the street and the building's entry |
| Scope of Analysis | There are varieties of physical and visual design patterns between the entry from the street and preschool building's entrance. |
| **CRITERIA 2: Way Finding (The Design and arrangement of transitional spaces allow children and parents to find the entry way easily)** | |
| **INDICATOR 1: Circulation System** | |
| **ITEM 1: Visibility of Entrance** | |
| Method 1: Design Oriented Analysis | |
| Focus | Settings entrance(s) |
| Scope of Analysis | Entrance(s) of the setting can be distinguished throughout the path that connects entry from the street to the building's entry. |
| **ITEM 2: Visible Boundaries** | |
| Method 1: Design Oriented Analysis | |
| Focus | Physical and visual definition of outdoor circulation paths |
| Scope of Analysis | Circulation path that connects the entry from the street to the building's entry is legible and well defined. |
| **ITEM 3: Logical Navigation** | |
| Method 1: Design Oriented Analysis | |
| Focus | Outdoor circulation paths |
| Scope of Analysis | Outdoor circulation system follows the guide for taking visitors to the intended destinations. |

| **CRITERIA 3: Identical Entrance (Characteristics of the entrance make it an identical feature of setting's building)** | |
|---|---|
| **INDICATOR 1: Identical Character of Entrance from Outside** | |
| **ITEM 1: Identical Form** | |
| Method 1: Design Oriented Analysis | |
| Focus | Entrance form |
| Scope of Analysis | The form of the entrance identifies its character and location. |
| **ITEM 2: Unique Visual Scope** | |
| Method 1: Design Oriented Analysis | |
| Focus | Visual characteristics of the entrance |
| Scope of Analysis | The visual characteristics of the entrance identify its character and location. |
| **ITEM 3: Dominance** | |
| Method 1: Design Oriented Analysis | |
| Focus | Visual characteristics of the entrance |
| Scope of Analysis | The design characteristics of the entrance are dominant in compare to its surrounding and the background. |
| **ITEM 4: Legibility** | |
| Method 1: Design Oriented Analysis | |
| Focus | Physical characteristic of the entrance |
| Scope of Analysis | The location and orientation of the entrance create a legible entry for the visitors. |
| **INDICATOR 2: Identical Visual Character of Entry Hall** | |
| **ITEM 1: Inviting Entry** | |
| Method 1: Design Oriented Analysis | |
| Focus | Visual characteristic of the entrance |
| Scope of Analysis | Visual characteristics of the entrance hall create a warm and welcoming environment. |

| Method 2: Daily Experience Based Interview | |
|---|---|
| Focus Group | Teachers and parents |
| Subject of Experience | Greeting during arrival and departure |
| Content of Question | Do they find the design of entrance hall warm and welcoming? |

| **ITEM 2: Visual Security** | |
|---|---|
| Method 1: Inclusive Contextual Observation | |
| Context | Entrance hall |
| Focus Group | Parents and teachers |
| Actions | Greeting during arrival and departure |
| Design Oriented Support | Location and orientation of the reception desk provide parents and children with an immediate visual contact with staff and teachers when they enter. |
| **ITEM 3: Calm Environment** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Entrance hall |
| Focus Group | Parents and teachers |
| Actions | Greeting during arrival and departure |
| Design Oriented Support | The amount of space, number of elements and furniture and lay out prevent crowd. |
| **INDICATOR 3: Functional Entry Hall** | |
| **ITEM 1: Space for socialization** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Entrance hall |
| Focus Group | Teachers, parents and children |
| Actions | Greeting during arrival and departure |
| Design Oriented Support | There is an appropriate space that serves teachers, parents and children for greeting and socialization during arrival and departure |
| **ITEM 1: Adequate Space and Furniture** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Entrance hall |
| Focus Group | Teachers, parents and children |
| Actions | Greeting during arrival and departure |
| Design Oriented Support | There is enough space and furniture based on the number of users. |
| **ITEM 3: Layout** | |
| Method 1: Daily Experience Based Interview | |
| Focus Group | Teachers |
| Subject of Experience | Greeting during arrival and departure |
| Content of Question | Do they have a control and visual access towards the children who are present and enter? |

| | |
|---|---|
| **ITEM 4: Adjacencies** | |
| Method 1: Design Oriented Analysis | |
| Focus | Location of the entrance |
| Scope of Analysis | Entrance hall is located on entry level. Entrance is adjacent with administration office and main activity area(s). |
| **ITEM 5: Exciting Opportunities** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Entrance hall |
| Focus Group | Children |
| Actions | Greeting during arrival and departure |
| Design Oriented Support | There are activities or opportunities that attract and engage children during arrival and departure. |

**KITCHEN**

**CRITERIA 1: Supports for Cooking Practice (Design and arrangement of spaces enhance children's cooking practice)**

**INDICATOR 1: Free Interaction**

| | |
|---|---|
| **ITEM 1: Arrangement of Working Surfaces** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Kitchen |
| Focus Group | Children |
| Actions | During practicing cooking |
| Design Oriented Support | Scale and amount of surfaces appropriate for the proportion and amount of children. |
| **ITEM 2: Circulation Network** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Kitchen |
| Focus Group | Children |
| Actions | During practicing cooking/Serving and returning the meal |
| Design Oriented Support | There is enough amount of empty space based on the number of children that allows them to enter and exit without creating traffic. The amount of empty space around the working surfaces and displays allow all the children to move around without creating traffic and bumping to each other. The organization of the circulation path follows the intended patterns of movement during the cooking practice. |

| **ITEM 4: Safety** | |
|---|---|
| Method 1: Design Oriented Analysis | |
| Focus | Location of barriers and dividers |
| Scope of Analysis | Location of the dividers and barriers in the kitchen prevent children to enter the zones that threat their safety. |

**INDICATOR 2: Space Organization**

| **ITEM 1: Location** | |
|---|---|
| Method 1: Design Oriented Analysis | |
| Focus | Location of the kitchen |
| Scope of Analysis | Kitchen is located somewhere that has a link with children's everyday activities? |

| **ITEM 2: Visual Link** | |
|---|---|
| Method 1: Design Oriented Analysis | |
| Focus | Location of the kitchen |
| Scope of Analysis | Kitchen is located somewhere that has a link with children's everyday activities. |

| **ITEM 3: Adjacencies** | |
|---|---|
| Method 1: Design Oriented Analysis | |
| Focus | Location of the kitchen |
| Scope of Analysis | Kitchen has a visual link with the settings circulation route and provides a visual access for children during everyday life. |

**INDICATOR 3: Teachers' Full Supervision**

| **ITEM 1: Comfortable Movement** | | | |
|---|---|---|---|
| Method 1: Daily Experience Based Interview | | Method 2: Inclusive Contextual Observation | |
| Focus Group | Display units | Context | Kitchen |
| Subject of Experience | During practicing cooking | Focus Group | Teachers |
| Content of Question | Do they have a comfortable movement during the practices? If not state the problems and the areas that they feel uncomfortable. | Actions | During practicing cooking |
| | | Design Oriented Support | The amount of empty space allows teachers to move around easily without disturbing children. |

| **ITEM 2: Full Visual Contact** | |
|---|---|
| Method 1: Daily Experience Based Interview | |
| Focus Group | Teachers |
| Subject of Experience | During practicing cooking |
| Content of Question | Does the arrangement and planning the space provide their full vision over all the children in every spot? |

| | |
|---|---|
| **CRITERIA 2: Supports for Socialization (Design and arrangement of spaces enhance children's socialization)** | |
| **INDICATOR 1: Layout for Communication** | |
| **ITEM 1: Display Units** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Kitchen |
| Focus Group | Children |
| Actions | Visual and physical access to the materials |
| Design Oriented Support | Scale, location, orientation and design of the display allow them to have a full visual and physical access to all the materials. |
| **ITEM 2: Group Work Oriented Design** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Kitchen |
| Focus Group | Children |
| Actions | Socialization and cooperation |
| Design Oriented Support | Shape and amount of tables or counters support children's socialization and cooperation. |
| **ITEM 3: Exhibition Area** | |
| Method 1: Daily Experience Based Interview | |
| Focus Group | Teachers |
| Subject of Experience | During practicing cooking |
| Content of Question | There is a solution for exhibiting children's products at the end of practice. If yes is the design and location appropriate for this intention. |
| **DINING AREA** | |
| **CRITERIA 1: Pleasant Dining Environment (Design and arrangement of spaces provide a pleasant dining experience for children and teachers)** | |
| **INDICATOR 1: Enhance Eating in Comfort** | |

| | |
|---|---|
| **ITEM 1: Seating Units** | |
| Method 1: Daily Experience Based Interview | |
| Focus Group | Teachers and children |
| Subject of Experience | Sitting during having their meals |
| Content of Question | Do they feel comfortable with the available chairs and tables? |
| **ITEM 2: Adequate Space** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Dining area |
| Focus Group | Children and teachers |
| Actions | During dining |
| Design Oriented Support | There is enough space based on the number of users and furniture to prevent crowd. |
| **ITEM 3: Good Acoustic** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Dining area |
| Focus Group | Children and teachers |
| Actions | Serving and having their meal |
| Design Oriented Support | Acoustical solutions prevent noise. |
| **ITEM 4: Lighting** | |
| Method 1: Design Oriented Analysis | |
| Focus | Location of the entrance |
| Scope of Analysis | Area gets enough light.(natural lighting is preferred) |
| **ITEM 5: Air Quality** | |
| Method 1: Daily Experience Based Interview | |
| Focus Group | Teachers and children |
| Subject of Experience | Sitting during having their meals |
| Content of Question | Is the overall design of the space providing a pleasant temperature and air quality? |

| | |
|---|---|
| **INDICATOR 2: Comfortable Circulation** | |
| **ITEM 1: Traffic Flow** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Dining area |
| Focus Group | Children and teachers |
| Actions | Serving and returning their dishes/Using the lavatories |
| Design Oriented Support | The amount and organization of the circulation area allow children to accomplish these actions without bumping to each other or facing any danger. |
| **ITEM 5: Adjacencies** | |
| Method 1: Design Oriented Analysis | |
| Focus | Location of the entrance |
| Scope of Analysis | Space has an adjacency with where meals are served and has visual/physical link with the outdoor. Space has an access to the lavatory while it is physically separated from lavatories. |
| **ITEM 3: Location of Furniture** | |
| Method 1: Design Oriented Analysis | |
| Focus | Location of the entrance |
| Scope of Analysis | Seating elements are located in an area far the traffic flow. |
| **INDICATOR 3: Identity** | |
| **ITEM 1: Dining Oriented Organization** | |
| Method 1: Design Oriented Analysis | |
| Focus | Design and arrangement of dining area |
| Scope of Analysis | The overall design and arrangement of the dining area represent the culture of eating |
| **ITEM 2: Unique Furniture** | |
| Method 1: Design Oriented Analysis | |
| Focus | Design characteristics of seating elements |
| Scope of Analysis | Sitting elements in dining area have distinctive characteristics in compare to seating elements in other spaces in setting. |
| **LAVATORIES** | |
| **CRITERIA 1: Supports for Pleasant Practice (Design and arrangement of spaces enhance children's toilet training)** | |
| **INDICATOR 1: Physical Comfort** | |

| | |
|---|---|
| **ITEM 1: Scale** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Lavatory |
| Focus Group | Children |
| Actions | Using the toilet and washing hands |
| Design Oriented Support | Scale of the furniture and fixture in lavatories are appropriate for children' proportion and allow their independent use. |
| **ITEM 2: Visual Attractions** | |
| Method 1: Design Oriented Analysis | |
| Focus | Visual and physical characteristics of lavatory |
| Scope of Analysis | There are interesting design characteristics that attracts children. |
| **ITEM 3: Practical Layout** | |
| Method 1: Design Oriented Analysis | |
| Focus | Storage to keep stools and pullouts |
| Scope of Analysis | There is a suitable and safe storage for keeping the stools and pullouts inside or close to the lavatories. |

**INDICATOR 1: Space Organization**

| | |
|---|---|
| **ITEM 1: Central Location** | |
| Method 1: Design Oriented Analysis | |
| Focus | Location of the lavatory |
| Scope of Analysis | The lavatory has central location and allows children to access the lavatory easily from the main activity areas. |
| **ITEM 2: Adjacencies** | |
| Method 1: Design Oriented Analysis | |
| Focus | Location of the lavatory |
| Scope of Analysis | The lavatory has adjacency with messy area, dining area and main activity spaces. |
| **ITEM 3: Adequate Space** | |
| Method 1: Inclusive Contextual Observation | |
| Context | Lavatory |
| Focus Group | Children and teachers |
| Actions | During undressing and dressing up |
| Design Oriented Support | The amount of space allows children and teachers to accomplish these actions without creating crowd and chaos. |

| **ITEM 4: Line of Sight for Teachers** | |
|---|---|
| Method 1: Daily Experience Based Interview | |
| Focus Group | Teachers |
| Subject of Experience | Children independent entry and exit from the lavatory |
| Content of Question | Do they have a visual contact with the entry of the lavatory from the main activity to be able to control children’s entry and exit from this space? |

**INDICATOR 1: Physical Comfort**

| **ITEM 1: Partitioning** | |
|---|---|
| Method 1: Inclusive Contextual Observation | |
| Context | Lavatory |
| Focus Group | Children and teachers |
| Actions | Using the toilet |
| Design Oriented Support | The height of the dividers allows children to remain out of sight while seated while allow them to have a visual contact with outside of cubical when they stand. |

## 4.4 Model's Manual

The manual that is defined in this section conducts a training and facilitation for inspectors before using the 'Preschool Interior Space (PIS) Design Quality Evaluation Model'. This manual assists the inspectors to implement and use the evaluation model in a practical way. The presented strategies in the manual help evaluator to go parallel with initial intentions of the evaluation model and as a result achieve reliable outcomes and results. This manual is organized though the steps which are defined and described below.

### 4.4.1 Preparation for Evaluation

Before starting the evaluation process evaluator needs to be thoughtfully prepared. Evaluator should follow three steps and develop her/his skills and knowledge until she/he feels familiar with the whole process and intentions of the evaluation. These three steps are as follow:

1. **Readjusting the framework for the intended setting**

Evaluator is expected to identify the categories of evaluation before starting the evaluation. To identify the necessary categories evaluator needs to learn the curriculum and daily routine of the setting and identify the categories she/he needs to consider based on learning experiences that are included in settings curriculum.

In cases that setting's curriculum includes learning experiences that are not included in the framework of the model, evaluator is expected to state these additional experiences and their patterns of activities in the evaluation report for model's further development.

**2. Reading the theoretical body of the model**

The theoretical framework of the model includes description of design criteria that are necessary for supporting patterns of activities during learning experiences (section 3.3). In cases that evaluator face difficulty in understanding the scope of evaluation of the items she/he can refer to this section and read the descriptions.

**3. Read the model's methodological guideline**

Evaluator is expected to be familiar with the requirements of the methodologies that are suggested for evaluating the items. It is suggested that evaluators read the definition of these methodologies (section 4.2) before staring the procedure of evaluation.

### 4.4.2 Evaluator(s) Ethics

Evaluators should improve their skills and manners in three areas including (Canadian Evaluation Society. CES Guidelines for Ethical Conduct, n.d.):

**1. Competence:** Evaluator is required to use the systematic methodologies that are predefined in the model and provide an evaluation content that fits the evaluation intentions.

**2. Integrity:** Evaluator is required to improve her/his skills in terms of communication and cooperation with preschool children and respect the culture and social environment of the preschool setting. It is also expected from the evaluator to be open to the comments and suggestions of the teachers, staff and parents about the evaluation procedure include these comments and suggestions in the evaluation report.

**3. Accountability:** Evaluator is required to prepare a timetable for the evaluation and submit it to the setting in the beginning of the evaluation and she/he is required to be responsible for completing the evaluation within the prepared timeframe. Also

Evaluator is required to be responsible in terms of accuracy of the evaluation report and be honest and truthful about the findings and results.

### 4.4.3 Writing and Completing the Report

To write a report on the strengths and weaknesses of each evaluation item, inspectors are expected to record all the positive and negative issues in controlling the functionality of each item in respond to the intended patterns of activities or scope of evaluation. Describing the strengths of design criteria include the reasons that criteria's evaluation item is successful in enhancing the patterns of learning experiences. Describing weaknesses of each design criteria include the reasons that criteria's evaluation item fail in enhancing the patterns of learning experiences. These descriptions need to be written for each evaluation criteria by following the methodologies that are suggested in the framework of the model.

Evaluators are expected to finish the report by stating their personal experiences during the evaluation procedure. In this statement evaluator is requested to include the problems, difficulties, doubts and missing she/he has experienced in using current model.

### 4.4.4 Sensitivity and Accuracy during Evaluation

During the evaluation process evaluator(s) is expected to be sensitive and avoid any issue that would threat the accuracy of her/his findings. For a sensitive and accurate evaluation, evaluator is expected to:

1. Have the discipline for providing the information that would be useful and accurate based on the scope of evaluation of evaluation criteria's.
2. Follow the systematic procedure that is defined in the evaluation framework of the model and avoid scattered data collection.

3. Rely on the nature of evidences and evaluate the items in relation to the requirements of patterns of activities that happen in the setting and avoid the personal idea and interest.

4. Be sensitive to remove bias and maximize the objectivity.

5. Use visual evidence and include sketches, drawing and photographs of actual situations in completing the evaluation criteria. The visuals should provide insights on the relationship between the design of spaces and actual patterns of learning activities. These visuals should be clear and help readers to understand the strength or weakness of design by shaping a broad picture of the actual situations.

# Chapter 5

# CONCLUSION

The reason for proposing current thesis was lack of an evaluation model that would control the design quality of preschools' interior spaces in relation to the patterns of everyday learning experiences. The need for establishing this model was due to deficiency of existing rating scales and assessment tools in evaluating the design and arrangement of preschool spaces by considering their contextual requirements.

Current study adopt a systematic path of investigation and propose a model that would answer the research question and generate a report that describes the strengths and weaknesses of interior design in relation to the requirements of their everyday learning experiences. The structure of the model that is proposed in current study consists of:

**1. 12 Categories:** Spaces that serve main patterns of learning experiences happen.

**2. 21 Evaluation Criteria**: Design criteria that need to be available in spaces in order to support the requirements of learning experiences patterns.

**3. 45 Indicators**: Design requirements of criteria that design of spaces need to respond in order to enhance the design criteria.

**4. 135 Items**: Design characteristics of spaces that are necessary in order to respond to the requirements of the criteria and enhance the patterns of learning experiences.

Current model is aimed to be used by designers who are concerned to find out the weaknesses and problems with the design and arrangement of preschool spaces in relation to the everyday learning experiences and improve the quality of design quality. The goal of the report that will be established by using the current model is to help designers understand the respond of existing design solutions to the requirements of patterns of learning activities and shape descriptive evaluation on these responds based on actual situations.

The evaluation report that will be established by using proposed evaluation model will include two sections. One section will indicate the strengths of design and other section will indicate the weaknesses of design in preschool spaces. Prior to using this evaluation model the evaluator should read the model's manual carefully and be certain on all the necessary process for filling out the framework and providing a reliable report.

The proposed evaluation model covers four objectives that were defined at the beginning of the research and is contextually sensitive and considers the divers goal of early childhood education, consider staff, children and education in evaluating the design of spaces, include methods that guide inspectors to evaluate the design and arrangement of spaces in relation the everyday learning experiences and encourage inspectors to include the visual presentation of their results. The following contributions to the field of interior design and early childhood education have been made as part of current thesis:

**1. A new perspective on the concept of design quality in educational space**

The concept of design quality that is introduced and discussed in this study encompasses different dimensions of learning environment and intends to improve the quality of learning and everyday experiences parallel with the quality of spaces. Based on findings in this thesis, the design and arrangement of educational spaces are qualified if they answer the requirements of central quality in learning environment. In case of preschool, which is the focus of current study, it has been concluded that the central quality in preschools is shaped by educational based strategies, developmental based characteristics of children, teachers' performance and facilitation and temporary existence of parents during every day learning experiences. Based on the findings in this research a quality design in educational spaces is required to enhance the requirements of central quality in educational settings.

**2. Theoretical body of knowledge on where design and arrangement of preschool spaces meet the preschools' learning patterns**

This study adopts a broad perspective over the patterns of learning experiences in everyday life of preschools and the results benefit designers and teachers in greater extent. An understanding of the requirements of central quality during patterns of learning experiences in spaces is developed as a theoretical framework that describes the transactional relationship between design and arrangement of spaces and the learning environment. This theoretical framework shaped the theoretical body of the model and defined a descriptive guideline on the scope of evaluation for each design criteria that is included in the evaluation framework of the model.

**3. A systematic approach to shape design quality evaluation model for educational facilities**

A systematic approach that is introduced in this thesis introduces a step by step framework that can be adopted for shaping interior space design quality evaluation models for other educational facilities. Systematic path of shaping the model in current thesis introduce an investigation system that can be adopted for other educational facilities.

**4. An evaluation framework that control the design quality of preschool spaces based on contextual requirements**

The system of evaluation that is purposed in the framework of the model, guide inspectors to consider the life and contextual requirements of the intended setting in their evaluation process and determine the performance of the design and arrangement of spaces in relation to the actual learning situations. The purposed framework allow post occupancy evaluation of the preschool settings for generating comprehensive results that would improve the concept of quality in field of early childhood educational spaces.

This research is intended to be the beginning of a larger scale of evaluation models with the consideration of design quality of interior spaces in relation to the everyday life they house. There are plenty possibilities for further studies based on the findings in current thesis which few are discussed as follow:

- There should be more evidence based researches on transactional relationship between the design of spaces and their living system. These researches should be established with the intention of examining the responses of the design solutions towards the patterns of experiences that keep happening and shape the everyday life of spaces.

- This study focus on design quality of preschool spaces. Further studies can be carried out in providing post occupancy evaluation models for other stages of education in order to achieve comprehensive results and enrich the theoretical knowledge in field of design quality of educational space.

- New design criteria, indicators and items can be identified by using the purposed model on diverse cases. New information would develop the framework of the model and keep the model up to date.

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