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**The design and implementation of project-based, child-centred
curricular material for use by un(der) qualified educators in the slums
of India**

Master's Thesis
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SUMMARY

In Ahmedabad, a city in west India, Pratham, a non governmental organization [NGO] is implementing curriculum material that is trying to prevent children from dropping out of the regular schools system. During the implementation of this materials Pratham experienced some problems with the material. These problems are: the materials implemented by Pratham are not of enough quality to be used by un(der)qualified educators in slums. The current design process is not leading towards good quality materials that can be implemented by un(der) qualified educators in slums. And the current implementation process is not leading towards an adoption of the materials by the educators in slums.

There is a strong link between the curriculum materials, the design process and the implementation process of these materials. If the materials aren't of good quality it is most likely that the implementation of these materials is going to give some problems. Also the design process of these materials will determine the quality or characteristics of the materials. This is why these three areas are combined in this study. Pratham needs to make improvements on each of these areas, in order to meet its mission. The aim of this research (formative evaluation) is to answer the following research question: *“What should be the characteristics of curriculum materials for use by un(der) qualified educators in the slums of India, and how should the design and implementation processes be shaped?”*

To be able to understand the characteristics of these three areas a way to categorize these characteristics was chosen. The categories that are used to understand the characteristics are the quality criteria (validity, legitimacy and efficacy). To retrieve data an analysis of the current situation is performed. The data derived from this analysis is used as input for the (re)design. After the design, an evaluation is conducted. The procedure of data gathering, is simultaneous with the activities of the design team (NOS-team) of Pratham. The respondents were selected on the basis of their function within the organization, their knowledge and their experiences. In order to collect the data the following instruments are used; Interview schema's, Focusgroupdiscussion, classroom observation schemes, logbooks, documentation analysis by the use of checklists and daily notes of the teachers.

Findings on the characteristics of the curriculum materials are that the materials should be accurate for the education of slum children of different levels, the activities should be group activities. The teacher guidance of the materials must be prescriptive, step by step. The language needs to be easy and understandable. All materials that is needed for the activities needs to be present in the trunk in the DLC, because of the characteristics of slum education. The curriculum materials need to be consistent, safe and physically robust. The design process should be based on design criteria derived from the analysis phase. These criteria need to be formulated and agreed upon in the beginning of the process. These criteria shape the total process. The formative evaluations are structured and invite the input from children and Balsaki's. Prototypes are made and used to improve the designs. Everyone in the design team follows the same process includes the same components in the design and documents and presents the design in the same way. The process should use micro teaching sessions to implement the curriculum material. Additionally these sessions improve the teaching skills of the teacher and introduce the content of the materials. The teachers need to learn the subject before the implementation of the materials can happen. Additionally the process need to stimulate that the materials are used in the way there are intended.

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PREFACE

On 12 march 2007 I took the plane to this research project. I was going to India! Chock full of expectations about the county and the people. My suitcase chock full of educational literature. My head chock full also, full with thoughts and hope on the things I was going to learn about educational science and curriculum design, and the things I was going to realize during the next 5 months.

There was one thing I knew in advance. During the preparation of my stay in India and the work for Pratham, dr. Susan McKenney and I agreed that this study wasn't going to create a 'manual' on curriculum design. My mission was to create a 'mind click' in Pratham and in the heads of the design team. A click that would sustain, that was still helping them, even after I was gone. We 'clicked', and the best news is, they are continuing to 'click'.

Last week I received an email from the management of Pratham asking me if I could send them some more information on creating balance and consistency between the different components of the curriculum material (click)!

During this study not only the competences of the design team of Pratham increased, my competences also increased tremendously. The things I've learned from this research can be categorized as practical things (leading a team, facilitating, scaffolding, applying the scientific knowledge) and scientific things (I had my own mind click in writing transitions, the usage of literature, validity issues, the usage of instruments). I never imagined that during the very last phase of my education I would learn this much nor that I would have so much fun while doing it!

I would like to thank dr. Susan E. McKenney for motivating me to learn this much, and of course for the useful guidance and inspiration. I would like to thank dr. Wilmad A.J.M. Kuiper for the feedback and enthusiasm. I also would like to thank my family and friends for listening over and over again to stories about divisions of chapters, difficulties with transitions, and insecurities on the tremendous size of the research question. Special thanks goes to Kat and Anneloes, for helping me out with the writing, to Niels for the support and calmness and to my parents for visiting me in India, and sharing this experience.

Marlies

1. INTRODUCTION

1.1. BACKGROUND OF THE STUDY

In Ahmedabad, west India, there are many slums. Slums where children live, children who are likely to grow up without seeing a classroom more than one year in total. Luckily for these children Non Governmental Organizations [NGO's], are working very hard to give these children an education. One of these organisations is Pratham, Gujarat Education Initiative. This is an NGO which is trying to implement educational innovations that will prevent these children to drop out of the regular educational systems provided by the government. Important issues considering the background of the study are the Democratic Learning Centre [DLC], the Trunks and the NOS team.

One of the current programs of Pratham in which this prevention is offered is the DLC (Democratic Learning Centre) program. Also to other aspects of the provided education are innovative, the curricular materials are project-based and the education is child-centred. In this program small rooms (living rooms of slum houses, see figure 1) are turned into a classroom. In these rooms an innovative way of education is provided. There are 12-20 children different in age, who visit the DLC, when they want to/ are able to. This means that there is not one level and that there are no classes. In a DLC a Balsaki (which means 'friend of the child') is helping the children to learn.

The earlier described project based curricular material is organized in trunks (see appendix, 9.1.). A trunk is providing everything the child and 'the teacher' need for a specific content (e.g. Science, Maths, Art) for one month of education. This means that materials needed for learning are provided in the trunk. But also the lesson plans are inside the trunk. Teacher guidance is offered, time lines are presented. Even assessment and monitoring sheets are provided. The Balsaki can literally pick up a lesson plan and start to teach.

The people who design these materials and content of the trunks are organized in a team, this team is called the NOS-team. The abbreviation 'NOS' stands for 'National Open School', an old program of Pratham. The people in the NOS-team all have a different background. A similarity between these people, organized in the NOS-team of Pratham is that they are all just graduated on a masters level. This means that they are scouted during their graduation period. The NOS-team consists of approximately ten people. The majority of these youngster graduated on social studies (sociology, psychology, development studies), a few have a technical background (business administration or science). Another similarity is that the team doesn't have experience with designing education nor teaching experience.

1.2. PROBLEM STATEMENT

This research is based on the experiences with the implementation of the trunks in DLC's of Pratham. There is no clear goal of the lessons, no clear picture of the content of the written curriculum material, the time period of the material is not realistic, there is no sufficient teacher guidance for the un(der) qualified educators, the grouping of the children seems to be a big problem, the assessment is not testing the level of the children but the quality of the materials, the educators are not able to give feedback based on the assessment. There doesn't seem to be any consistency between the different components of the material. This leads to a situation that is far from optimal.

Besides these problems the design process used for the material also seems to be problematic. Evaluation plays a big role in the organization, while aiming at using evaluation as a strategy to improve the product, the character of the evaluations is primarily summative. The organization is, without knowing conducting summative evaluations instead of formative ones. Because of all these difficulties, little attention is being paid to the actual design questions, considering a child centred educational approach, with an innovative way of grouping children.

1.2.1. Initial problem statement

These experienced difficulties can be categorized into three different areas. These are: the characteristics of the material, the design process of the materials and the implementation of the materials. Pratham needs to make improvements on each of these areas, in order to meet its mission. The current curriculum materials are not of enough quality to be used by un(der) qualified educators in slums. Besides this the current design process is not leading towards good quality materials that can be implemented by un(der) qualified educators in slums. Additionally, the third problem is that the current implementation process is not leading towards adoption of the materials by the educators in slums. Combined, these problems can be formulated in an initial problem statement: *“What should be the characteristics of curriculum materials for use by un(der) qualified educators in the slums of India, and how should the design and implementation processes be shaped?”*

To be able to answer this question research (formative evaluation) and design is combined. This study consist of three phases. An analysis phase, a design phase, and an evaluation phase. First the present material, design process and implementation process were analyzed. During this analysis the researcher had the role of participant/observer. Based on the outcomes of this analysis, design criteria were formulated. Scaffolded by these criteria, a design was made (for the material, the design process and the implementation process). During the design phase of this study the researcher had the role of facilitator. The third phase of the study is the evaluation phase, the redesign of the material, the design process and the implementation process were evaluated. During this evaluation the researcher had the role of participant/observer.

1.3. RELEVANCE OF THE STUDY

The relevance of this study is that the curriculum materials of Pratham, the design process and the implementation process will be improved. The curriculum materials will be of high quality because of the methods used and because of the applied quality criteria. The design process is designed in such a way that it is leading towards good quality materials. The implementation process is shaped in such a way that the materials can be adopted in educational practice by un(der) qualified educators in the slums of India. The scientific relevance of this study is the utilization of the quality criteria as a categorization. These criteria are not only used to give an indication of the quality of the curriculum material, but are also operationalized in such a way that they are usable for the two other areas of this study. The design process and the implementation process are judged with the help of these criteria.

1.4. OVERVIEW OF SUBSEQUENT CHAPTERS

The thesis has six chapters. The second chapter (after this introduction chapter) focuses on the contextual issues that will influence the research and the design. The third chapter deals with reviewing the literature on topics related to the characteristics of the

curriculum, the design process and the implementation process. The fourth chapter presents a detailed description of the methodology conducted. (the research design, method, procedures, instrument, respondents, data analysis). The fifth chapter presents the designs. The characteristics of the designed material, the shape of the design process and the implementation process is presented. The next chapter presents the findings on the research. In this chapter one can find the reason why the design is shaped the way it is. On all question raised in chapter four, findings will be presented, an answer is given to the sub question as well as a description of the evidence. The last chapter focuses on the discussion of the results. A summation is given of the findings as well as a conclusion. In the section strengths and weaknesses of the study a critical view on the findings and methods used is presented. The thesis closes with recommendations made based on the findings. In the appendix a portrait of the trunk is given.

2. UNDERSTANDING THE CONTEXT

2.1. UNDERSTANDING INDIA

2.1.1. *India, the people and the country*

India is an extremely large country, so to be able to put the rest of the research into perspective, I will start by looking at some general facts and figures about the country and its people. India is a vast country covering about 329 million hectares of land and providing shelter for a population of over 1.2 billion. India has to support about 16 per cent of the world's population on only 2.4 percent of land and on 2 percent of the world's total income (Chauhan, 2004). During the last 50 years, the population of India has tripled. With the birth of 48000 children per day, 19 million are added every year to the already astounding numbers of India. Because of this high birth rate, the population of school-aged children is almost 32 per cent (2007 est.) of the total population.

2.1.2. *Characteristics of education in India*

At the time of the 7th All India Educational Survey (2002) there were 261.5 million children aged between 4 and 14 living in the country, 53 percent being male and 47 percent female. All these children are offered free education by the Indian government. The state is constitutionally obliged to provide free and compulsory education to all children under Article 45 of the constitution. In general, an Indian child can receive education in two ways: in a government school or in a private school. The government schools are managed by the Ministry of Human Resource Development (MHRD) This Ministry has two departments: The Department of School Education and Literacy. And the Department of Higher Education. The Department of School Education and Literacy consists of three sections; elementary education, secondary education and adult education and literacy (MHRD, 2007). The government itself (Kumar, 2006) runs approximately 66 percent of the primary schools. 16 percent of all schools in India are run by private organizations, some of which are aided by the government and some are unaided. Besides this, some schools are also run by tribal and social welfare departments and the local management body (National Council for Educational Research and Training [NCERT], 2004).

Primary schools managed by the government have an average of 2.54 teachers per school compared to 4.76 teachers in privately managed schools. There are about 4.17 teachers per school working in India (Kumar, 2006). Only half of the teachers in primary schools are graduates (Metha, 2006). The child-teacher ratio in both government and private schools is very high, in India's government schools the average is 50 children in a class.

The characteristics of the schools are worth addressing too. In India, there are 1.04 million schools. 4.5 percent of the schools in India do not have a building. 73 percent of the schools operate in puccas (stone houses) and the rest in cuchas (mud huts). Most of the Indian schools do not have any sanitary facilities or infrastructure (water, electricity). The majority of the schools only have one classroom where an average of 41 children are taught. About 50 percent of the schools have a blackboard at ground level in the classroom, 8 percent have a computer. With regards to the 'software' of

schools there are also concerns relating to teacher training, the quality of the curriculum, assessment of learning achievements and the efficacy of school management (Unicef, 2004).

2.1.3. Problems & Challenges

After India became independent (from Britain), the demand for education was more forceful from the disadvantaged classes than from the upper and upper-middle classes. Before independence, higher education was available only to a selected few belonging to the privileged classes, mostly concentrated in the urban areas. With increased emphasis on industrialization, new employment opportunities emerged which were a result of the social, economic, scientific and technological advancement. Schooling is one of the most powerful instruments for reducing poverty, unemployment and inequity (World Bank, 2004). This creates a strange and strong vacuum; the poor need education to grow and get better living circumstances, but because of the fact that they are poor, the chance of getting proper education is small. This is pointed out by the following passage from the World Bank (2004) in their latest report on India: “There are large differences in primary school attendance and completion rates across social groups, with scheduled tribes having the lowest attendance and completion rates of all groups, followed by scheduled castes and other backward castes.”

As the above-mentioned text clarifies, social status still has a major influence on education in India today. The percentages of school attendance are appallingly low in tribal areas, backward districts and among the Scheduled Castes and Scheduled Tribes (UNESCO, 2007). There are four different reasons for educational deprivation of Scheduled Castes. The first is that these people suffer from socio-economic problems. They are isolated from the mainstream of Indian life and culture, because of their technological, economic, social, political & educational backwardness. Besides this, different research has proven that people from scheduled castes suffer from some specific psychological problems. Failure more than once, experienced by these children resulted in a strong sense of insecurity, but also lack of interest, aspiration and ambition in life can be seen (Caldas, 2001). There are academic and administrative problems and sometimes an indifferent attitude of tribal parents and teachers is mentioned (Pradhan, in D.C. Sah, 2004).

Besides the problems of poverty and the caste system of Indian education, another very ‘international problem’, concerning gender issues, also plays a big role in this country. Girls in each age group have a significantly lower probability of school and primary school attendance, 12-year old girls being 7 percent less likely to complete primary school than 12-year old boys (World Bank, 2004). While the overall enrolment of girls has increased, the drop-out rate of girls from marginalized and rural sections, especially from the upper primary level upwards, is extremely high (UNESCO, 2007). A sizeable proportion of school drop-outs, chiefly migrant, poor and working children, are girls. School discontinuation rates of girls in rural areas are twice as high as that of boys (Vaidya, 2005). National-level surveys and data also show that 9 out of every 10 girls who enrol in school do not complete schooling (Desai, 1991).

There is a strong relation between gender issues and another problem concerning education in India as a whole; child labour. Work, and other forms of exploitative labour (especially in the context of children), is integral to all cultures and life situations within India as well as across the globe (UNESCO, 2006). It is also important to note that almost 93 percent of the workforce in the country is engaged in the unorganized sector. This is the major pull-out or keep-away factor for school aged children living in

slums. These theories will be elaborated in the chapter about the characteristics of slum children. Beside this, a majority of the children, because of the working children, enter schools with the cognitive and social capital derived from this background. However, the school curriculum not only ignores this rich experiential base but also denigrates it as being inferior. This phenomenon is both a consequence as well as an instrument of oppression and denial to which these sections of society have been subjected for centuries. (NCERT, 2007)

Other dramatic realities related to teachers in the Indian education system include the appalling student-teacher ratios. There are not enough of them. Most schools have only one teacher. As mentioned earlier, the average student-teacher ratio is 50:1 (UNESCO, 2007). The World Bank (2004) states that a child is more likely to drop out when the ratio is above 50:1. Another major problem with the Indian teachers is their absenteeism. A study by PROBE (1999), based on a visit to over 200 primary schools across the country, found that the head teacher was absent in nearly a third of the schools on the day of the survey team's visit. A recent national survey focusing on service delivery in primary health centres and primary schools found that, on average, one-quarter of India's primary school teachers were not present at the schools where they are supposed to teach on any given day (Pritchett & Pande, 2006). This all has major effects on the accountability of schools in India.

And with this we come to the last problem we will examine in this chapter. The problems with enrolment and completion of education. This is probably India's biggest problem and is (as proven by many different researches) a summation of all the above-mentioned problems. An estimated 100-120 million children between the ages of 5-15 years have either never attended, or dropped out of school. They constitute 50 percent of the country's child population. Being out of school, they are subject to exploitation and the drudgery of work with little hope of realizing their full potential (NCERT, 2007). Parents keep their children at home, because in the schools the children are not likely to learn (Desai, 1991). It is often suggested that the low enrolment rate and the high drop-out rates are due to the role of the parents. It is said that parents do not see the value of education (Kumar, 2006) or that they are simply not interested in sending their children to school. Evans (2000) however states that this is a myth. The low enrolment and completion of education in India is caused by the low quality of the schools and teachers, he claims. One of the major reasons why children, both boys and girls, drop out is lack of interest in study, hostile environments, poor teaching, and non-comprehension (Nanda, 2007). India has made rapid strides in schooling during the last 4-5 decades. The gross primary enrolment rate, which was only 43 per cent in 1950-51, reached 100 percent by 1990-91. However, it has fallen slightly since then (World Bank, 2004).

2.1.4. Ongoing educational policy

In April 2000, around 150 countries, including India, met at Dakar, Senegal, to discuss educational issues. At the conclusion of the conference, the international community adopted the following six goals, which came to be known as the Education for All (EFA) goals:

1. Expanding and improving comprehensive early childhood care and education.
2. Ensuring that by 2015, all children, mainly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to and complete free and compulsory primary education of good quality.

1. Ensuring that the learning needs of all young people and adults are met through equitable access to appropriate learning and life skills programs.
2. Achieving a 50 per cent improvement in levels of adult literacy by 2015, especially among women. In addition, equitable access to basic and continuing education for all adults.
3. Eliminating gender disparities in primary and secondary education by 2005, and achieving gender equality in education by 2015, with a focus on ensuring girls' full and equal access to, and achievement in, basic education of good quality.
4. Improving every aspect of the quality of education, and ensuring excellence especially in literacy, numeracy and essential life skills (United Nations Educational Scientific and Cultural Organization [UNESCO], 2006) and achieve measurable learning outcomes.
5. To monitor progress towards the achievement of EFA goals set in Dakar, UNESCO has developed an index called the EFA Development Index (EDI), which consists of the arithmetical means of the following four constituent indices: Net Enrolment Ratio (NER) at the primary level, Adult Literacy Rate, Gender-related EFA Index and Survival Rate to Class V (Mundy, 2006).

India has made enormous progress throughout the last years to meet the above described goals. The 86th amendment (2002) to the Constitution of India has granted the right to education to all children of 6-14 years. This was a renewed promise the country made to 200 million children. The Directive Principles of State Policy (Article 45 of the constitution of India) ensures care and protection of children from birth until they reach school (0-6 years). This affects 150 million children whose health and well-being is a mandate that the State is obligated to honour. In this context, we as a global community need to consider our continued failure to universalize school education (NCERT, 2005). One of the most important constitutional provisions regarding education is incorporated in Article 45 of the constitution, which states: the state shall endeavour to provide, within a period of ten years from the commencement of this constitution, free and compulsory education for all children until they complete the age of fourteen years. (Chauhan, 2005)

This right to education has been carried out through different policies (Ministry of Human Resource Development [MHRD], 2006). Since independence, the central and state governments have been expanding the provision of primary formal and non-formal education to realise the goal of Universalization of Elementary Education (UEE). “The challenge now is to sustain and deepen current reforms in education and encourage local planning and management of strategies for expanding and improving primary education.” (Department of school education and literacy, 2007)

One programme, launched by the government of India to address quality issues, was Operation Blackboard. Under this program, the government provided a second teacher to all single teacher primary schools and a teaching-learning equipment package to all primary schools (World Bank, 2004). The most important current program launched by the government is called SSA (Sarva Shiksha Abhiyan). This is a program, with a clear period for universal elementary education. It is a response to the demand for quality basic education all over the country. The government also uses these interventions as an opportunity for promoting social justice through basic education. This can be seen as an expression of political will for universal elementary education across the country. The program is a partnership between the Central State and the Local government. It provides an opportunity for States to develop their own vision of elementary education (Ministry of Human Resource Development, 2007)

By many authors education is seen as one of the prime indicators of development as well as a tool to develop human and (simultaneously) social capital. Consequently, there is tremendous concern to educate the vast mass of the population (Kumar, 2006). The educational situation of India is also affected by international alignments. That is why it is meaningful to address the international policies, seen as they are having the biggest influence on the Indian situation.

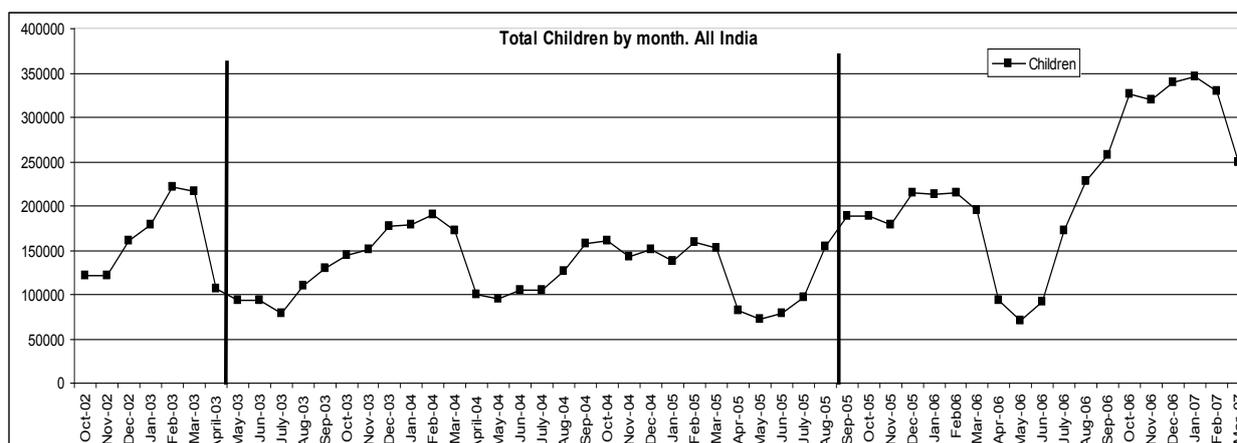
To summarise: India is a dazzling country when looking at numbers. Total population figures are unbelievable, and the growth of the country even goes beyond imagination. Unfortunately, the drop-out figures of children are showing the same high figures. India's education system is showing some serious problems when it comes to gender issues, enrolment rates, social deprivation and quality aspects. The government of India sees these problems as challenges and is making policies to overcome these challenges; their most important policy is currently SSA, which is working to provide good quality education throughout the country, by offering money, support and materials.

2.2. UNDERSTANDING PRATHAM

2.2.1. Development of the organization

Since the government of India is not yet able to solve its educational issues, there are many NGO's in India that focus on educational development. The mission of Pratham is to achieve the objective of: 'every child in school and learning well'. Initially this was meant to be only for the city of Mumbai. However, spontaneous and rapid replication of the Pratham concept and programs in different regions of India, and their relative success in scaling up wherever implemented, has expanded this aspiration on a national scale (Parikh & Acharya, 2001). Since 1994, Pratham has demonstrated that it can reach out of the grass-roots and get underprivileged children in both urban and rural settings into school and learning. It has spread to 29 centres across 10 states in India since 1994 to try to work on their mission (Abichandani, Blaser, Kaw & Shaw, 2004). Pratham started in the slums of Mumbai, as a result of the vision of a couple of committed individuals. These individuals decided to tackle the problems of education. To do this they could only see one way of solving this problem. This was to involve the people of Mumbai to help the government in its quest of universalising primary education (Pratham, 2007). UNICEF provided funding for Pratham, from its foundation up until the three following years. After these three years, this role has been taken over by the ICICI Bank, a private bank of India. Pratham's activities have spread to 21 states; assistance has come from the local governments, leading corporate houses and the local citizens. Currently, about 10,000 volunteers of the Pratham family are in the field, reaching out to over 350 000 children.

Figure 2.1; Total number of children educated by Pratham (Pratham, 2007).



2.2.2. Uniqueness of the organization

There are different elements that make Pratham's way of working unique and special. In this chapter, we will explore these aspects by looking at Pratham's work mode and the community participation. The work mode of Pratham is unique because the organization is based on a triangular partnership: the government, the corporate sector and the citizens. In each city, the corporate leaders have taken the lead, the government has responded by opening its school and sharing its facilities, and the community volunteers, mostly young enthusiastic women from slums, implement the Pratham programmes (Pratham, 2007, Website). Pratham recognizes that the primary education is fundamentally the responsibility of the governments and that the greatest improvement is likely to come when the governments efficiency and effectiveness improves. Pratham therefore strives to make the government system more effective by working with it at multiple levels. The underlying philosophy is to supplement the government and not supplant it (Pratham Research Centre, 2007). All Pratham programs are designed to ensure the following goals:

1. That the enrolment rate in schools increases
2. That the drop-out rate decreases. influencing both the above,
3. That learning in schools and communities increases (correlating to both goals above). Or, when this is impractical - for instance when child labour is involved: bring the education to the children.
4. That the digital divide is bridged (Pratham Research Centre, 2007).

The other major aspect, which makes Pratham unique, is that Pratham believes that any project must be accompanied by real community involvement. This element determines, to a large extent, the way the organization works and is influencing the content of the programmes. Pratham tries to empower the communities to handle their own responsibilities and give every citizen a chance to contribute in whatever way he/she thinks is best. An effort is made in order to create the necessary awareness amongst the communities about the importance of education through meetings, workshops etc. (Pratham, 2007). Pratham is truly a citizen's initiative. Wherever and whenever a citizen decides to take initiative and take interest in the field of primary education, Pratham is sprung into life. The main implementers of the programme are the first concern. The community volunteers are trained to become teachers. Or, as Pratham calls them 'Balsakis', which means, 'friend of the child'. Because of this fact, Pratham has to rely heavily on poorly educated (mainly) young women- from the slum communities (Abichandani, et al., 2004). These poorly educated women are both the strength and the weakness of Pratham. A positive side effect of this is another unique element of the Pratham organization: the empowerment of these women.

2.2.3. Current programs of Pratham (Gujarat)

The way Pratham is putting all these aspects into practice is by various programs. The programs of Pratham (Gujarat) have been changing rapidly over the past few years (Abichandani, et al., 2004). The last year Pratham has been putting a lot of effort into building DLC's (Democratic Learning Centres). Before this, Pratham did not have one place for their education. The current Pratham programmes, which are held in these DLC's, are reading classes, trunk education, Shishuwanchan (pre-school/ nursery) and the library program. Besides these programs, there is also the Outreach program, which is bringing education to the factories where children are working. The Read India campaign is working with students who are willing to volunteer and read with children

on the streets for a few minutes. The last program is the RCA (Rural Community Approach) or Block catalytic program) which brings education to children living in rural parts of India, following the same approach used in the DLC's (Interview Gargi).

2.2.4. Future of Pratham's work

Pratham is an organization, which is clearly thinking about the future of their work in the developing field. This is why sustainability and scalability are playing an important role. Sustainability of developmental achievements is a global objective. Especially in the field of education, financial sustainability and sustenance of values are distinctly different from other fields. When aiming for sustaining the quality of education, it cannot be done without requisite financial inputs. If enrolment of all children is to be sustained, it cannot be done without recurring inputs into infrastructure. Pratham is taking three forms of sustainability into account. These are financial sustainability, quality sustainability and knowledge sustainability of the people working for Pratham (Pratham research centre, 2007).

Generating programs that are replicable and scalable is another unique characteristic of Pratham. Both these attributes are closely linked with the available human and financial resources. They are also linked with the issue of sustainability. Most of the Pratham programmes work rapidly and bring many children back into school in a short span of time. Furthermore, the fact that Pratham's attitude towards the government is such that it is not making too many preconditions, leads to further collaborations.

To conclude, it can be said that Pratham is an NGO that specifically focuses on education. Its mission adapts to the high drop-out rates and low quality of the schools in India: every child in school, and learning well. The uniqueness of Pratham lies in the grass-root way of working. Every programme is born out of a citizen's initiative. This is linked to a strong belief of Pratham, the belief in the community involvement. This triangular relationship is what makes Pratham truly unique. This means that there is a collaboration of the before mentioned citizen with the government and the corporate sector. In combination with the current educational situation in India, Pratham is trying to help the government in addressing the challenges discussed in chapter one, and as a positive side effect, it is empowering the women in slums.

3. THEORETICAL FRAMEWORK

The discussion in this chapter centres around the three core ideas behind this study. These ideas relate to the areas of curriculum materials, design of curriculum materials and the implementation of these materials. There is a strong link between these areas, if the materials aren't of good quality it is most likely that the implementation of these materials is going to give some problems. Also the design process of these materials will determine the quality or characteristics of the materials. This is why these three areas are combined in this study.

3.1. CURRICULUM MATERIALS

Insights in the problem Pratham is having with its curriculum materials can be better understood when looking at the different aspects of curriculum materials. This section will start with a general view on the curriculum. After this the focus will be narrowed, attention will be paid to curriculum artifacts. In the last part of this section attention is paid to the quality of curriculum materials.

3.1.1. *Characteristics of curriculum*

From the main research question: *What should be the characteristics of curriculum materials for use by un(der) qualified educators in the slums of India, and how should the design and implementation processes be shaped?* and the current situation of Pratham we can see the need to explore the characteristics of a curriculum. This because the characteristics of these different aspects determine the quality of the materials. Important issues when describing the characteristics of a curriculum are the levels of curriculum, curriculum representations and the components of a curriculum

Levels of the curriculum

A distinction between various levels of the curriculum has proved to be very useful when talking about curricular activities: policy-making; design and development, evaluation and implementation (van den Akker, 2003, p.6). "The notion of levels contributes significantly to curriculum planning models by providing a technical production perspective on the question: Who should decide what in curriculum planning? This seemingly political and ethical question is thus answered as a technical question, that is Who has access to the appropriate 'data sources'. (Goodlad, 1977, in Posner, 1995). There are four levels of curriculum. The highest level is the macro level, which is addressing the curriculum on national or state level. Then the meso level is formulated, this is the school level. The micro level and nano level are smallest which respectively look to the classroom and to the individual (van den Akker, 1999).

Curriculum representations

Clarification of the representation of a curriculum is especially useful when trying to understand the problematic efforts to change the curriculum (Kelly, 1999). Curricula can be represented in various forms. Some educationalists speak of the 'total' and 'hidden' curriculum, and make a distinction between the official curriculum and the

actual curriculum (Kelly, 1999). A common broad distinction is between the ‘intended’, ‘implemented’, and ‘attained’ curriculum.

Components of a curriculum

One of the major challenges for curriculum improvement is creating balance and consistency between the various component of a curriculum (van den Akker, 2003). Walker (1990) makes a distinction between three major planning elements: content, purpose and organization of learning. However, curriculum, design and implementation problems have taught us that it is wise to pay explicit attention to a more elaborate list of components (McKenney et al., 2006). Also Eash (1991) states in the international encyclopaedia of curriculum that a curriculum consists of more components. Van den Akker makes a distinction between ten components that address specific questions about the planning of student learning.

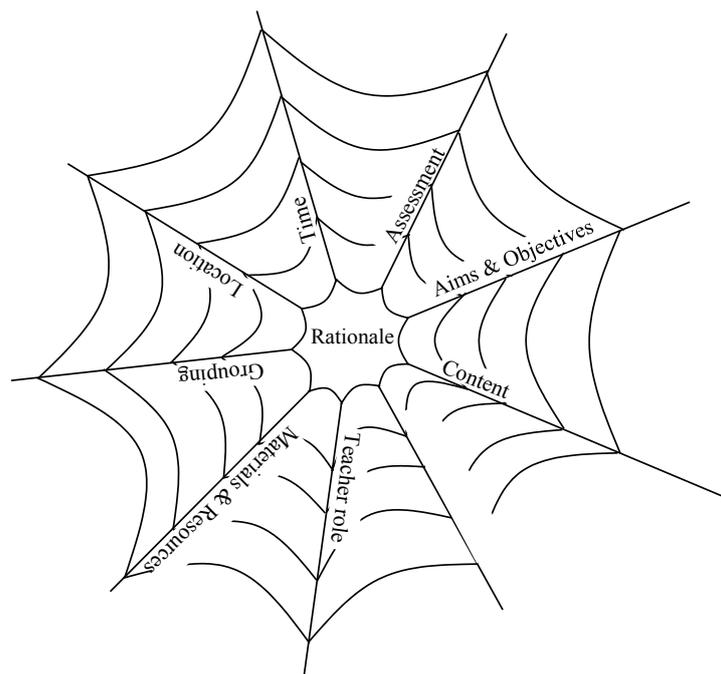
Table 3.1; Curriculum components (source: van den Akker, 2003).

<i>Curriculum component</i>	<i>Question</i>
1. Rational	Why are they learning?
2. Aims and objectives	Towards which goals are they learning?
3. Content	What are they learning?
4. Learning activities	How are they learning?
5. Teacher role	How is the teacher facilitating learning?
6. Materials en recourses	With what are they learning?
7. Grouping	With whom are they learning?
8. Location	Where are they learning?
9. Time	When are they learning?
10. Assessment	How far has learning progressed?

The rationale refers to overall principles or central mission of the plan. It serves as major orientation point (van den Akker, 2003). This view is supported by Kelly (1999) who state that the rationale of the curriculum should have priority while looking at the different curricular components. The nine other components are ideally linked to that rationale and preferable also consistent with each other. The second component of the model is the aims and objectives’. In this component the rationale gets a more concrete form The rationale needs to be translated into practical, realistic objectives to get a practical curriculum. The way to reach the aims and objectives component is explained by the third component; the content of the curriculum The content is organized by activities, this leads to the fourth component the learning activities. The fifth till tenth components are respectively the teacher role, materials and resources, grouping, location, time and assessment. Creating consistency between these components is a process of fine-tuning; all components should be interrelated and carefully chosen.

The preferential visualization (see figure 3.1) of the ten components is to arrange them as a spiderweb (van den Akker, 2003), not only illustrating its many interconnections, but also underlining its vulnerability. Thus, although the emphasis of curriculum design on specific components may vary over time, eventually some kind of alignment has to occur to maintain coherence (van den Akker, 2003). The spiderweb also illustrates a familiar expression: every chain is as strong as its weakest link. That seems another very appropriate metaphor for a curriculum, pointing to the complexity of efforts to improve the curriculum in a balanced, consistent and sustainable manner.

Figure 3.1; Vulnerable curricular spiderweb (Van den Akker, 2003)



An overview of the literature on the characteristics of curriculum materials is important for the current situation of Pratham. This because the characteristics of these different aspects determine the quality of the curriculum. A curriculum can have a variety of forms, these forms are also defined as curriculum artifacts. One can think of curriculum frameworks, curricular programs, including those that focus either on a full year of instruction or on a shorter period of time or on a single unit; including trade books and class sets of books teacher-created materials; and other resources, such as professional publication that focus on curriculum (Grossman & Thompson, 2004).

Curriculum materials can fall along a continuum, from a more prescriptive, specifying exactly what should be taught, to be more flexible offering guidance and ideas about what and how to teach, but leaving many of the necessary decisions up to the individual teacher (Grossman & Thompson, 2004).

There are four dimensions of curriculum materials. The scope of materials with regard to the content, the comprehensiveness of materials with regard to instruction, the flexibility of materials with regard to use and the support for teacher learning.

3.1.2. Characteristics of good quality materials

To better understand the quality aspects of the curriculum materials the next section gives an overview of relevant literature on characteristic of good quality materials and criteria to evaluate the quality.

Overall criteria for curriculum materials can be found in the work of Davis and Krajcik (2005). They state that designers must ensure that the base curriculum materials are accurate, compete and coherent in terms of content and effective in terms of pedagogy – with good representations of the content, a clear purpose for learning it, and multiple opportunities for students to explain their ideas (Davis & Krajcik, 2005).

More elaborated quality criteria can be found in the work of McKenney et al. (2006). In this work the criteria are divided into three main criteria and nine aspects, see table

3.2. The three main criteria will be described to get a better understanding of the meaning of good quality materials. These three criteria are viability, legitimacy and efficacy.

Table 3.2; Quality criteria for evaluation of curricular designs (source: McKenney et al., 2003).

<i>Criteria</i>	<i>Aspects</i>
Viability	Practicality
	Relevance
	Sustainability
Legitimacy	Contemporary scientific insights
	Consistency, harmony & coherence
Efficacy	Yield desired results
	Cost benefit ratio

Viability

Viability consist of three different quality criteria. These criteria are practicality, relevance and sustainability. Practicality is testing if the curriculum is realistically usable, in everyday practice. Relevance refers to if the curriculum is relevant to the needs and wishes of the users. For instance is the lesson or subject relevant to the wishes of both children, parents and teachers? Also the organization or developing team can have their say in relevance. Sustainability is examining if the curriculum is physically robust and also if the materials can still be used by the users after the implementation scaffolding fades.

Legitimacy

Legitimacy is looking at two different aspects. The contemporary scientific insights and the consistency, harmony and coherence of the curriculum. The insights are about if the rational behind the curriculum is based on contemporary scientific insights on educational issues.

The second aspect of legitimacy is comprehensive. It is called consistency, harmony and coherence. This criteria is combining all above theory about the levels of a curriculum, representation of the curriculum and the curriculum components.

Consistency should be reached at the various levels of the curriculum. Consistency between these components is created by taking into account all the levels while designing only one. Every level should be taken into account despite the level you are actually designing for. Also internal consistency should be reached. To realize this the components of the spiderweb should be in balance. The three representations of a curriculum (intended, implemented and attained curriculum) should be in harmony with each other, in order to be of good quality (McKenney et al., 2006). System coherence deals with the contextual factors of curriculum design. The three major influencing factors of the curricular context are school development, examination development and teacher development (McKenney et al., 2006). Quality in the design of the curriculum is only possible when these contextual factors have unity

Efficacy

Efficacy is dealing with yield desired results and the cost benefit ratio of the design. The curriculum must correspond with the desired results of the teachers, parents, state and the developers of the materials. The cost benefit ratio is measuring is the curriculum is worth the cost, time and efforts made, for the curriculum.

The theory on the quality of curriculum materials can be used by Pratham to understand the current situation and the gaps in the current designs. Additionally, these theories can be used to shape the curriculum materials in the future designs.

Another aspect that can lead to quality in curriculum material is by creating balance in the different processes of curriculum design and implementation. The ongoing processes that need to be balanced are:

- To connect fitting pedagogical and educational principles and concepts to the flexible visions, values and norms in society.
- To offer intellectual challenges to every student. This to create motivational and attractive education. Margins need to be found in adapting the education to the students.
- The pedagogical, educational visions needs to be made concrete in the materials. This can be done by creating materials that vary in their approach.
- To apply new insights and visions on how people learn in the materials. Also the materials should provoke learning.
- There needs to be made consistency between the different curriculum components and
- The relevance of the material for the students need to be measured. The community in which the students grow up should be the basis for this measurement.

3.1.3. Exemplary curriculum materials.

Against the backdrop of curriculum innovation, the role of lesson materials, especially those that illustrate desired practice (exemplary materials) is significant (McKenney, 2001). In general, exemplary materials have been found to be especially useful during the initial phases of curriculum implementation. Van den Akker (1998) summarizes three main advantages offered by exemplary materials:

1. Cleared understanding of how to translate curriculum ideas into classroom practice
2. Concrete foothold for execution of lessons that resemble the original intention of the Designers
3. Stimulation of reflection on one's own role with the eventual possibility of adjusting one's own attitude toward the innovation

Teachers decisions about what to implement in their classrooms, and how to implement it, are mediated through the curriculum materials they use (Stylianides, 2007). The design & spread of curriculum material is one of the oldest strategies for attempting to influence classroom instruction. For curriculum to be a vehicle for reform, teachers must be supported and guided in making adaptations that maintain the reform of the goals of the curriculum materials (Drake & Sherin, 2006; Davis & Krajcik, 2005).

Teachers use educative material most when planning, focussing on what they needed to know to enact a lesson with their students, and thus attended to educative features closely related to specific lessons. Teachers understand lesson specific ideas better than content or pedagogy when using educative materials. This is also proven by the study of Thijs and van den Berg (2000), they state that the materials can help teachers to understand the critical features of the proposed change. This because through the usage of the materials the teachers will picture how a proposed innovation will work in daily practice. Teachers practices are more consistent with those intended for specific lessons than they were for the unit overall. (Schneider & Krajcik, 2002). The characteristics of the materials should be such that it provides a clear understanding of core curriculum aspects, it offers concrete examples of how this translates into practice and it stimulates reflection by the user. Hameyer & Louck-Horsley, 1989 in, (McKenney, 2001) say that the materials need to be sufficiently flexible for varied use, applicable to different schemes of teaching, the fundamental aims need to be clearly exposed and the

conditions under which it works need to be specified.

One way to support teacher learning is through curriculum materials designed to be educative for teachers (Ball & Cohen, 1996). Curriculum materials including textbooks, teacher guides and technology-based materials, have traditionally been designed with student learning as the goals. However, materials can be designed to support learning by teachers as well as by students. Educative curriculum materials are designed to support teacher learning, as teachers use the materials to support student learning. Curriculum materials that are created by using principles as alignment with standards, contextualisation, sustained student inquiry, embedded learning technologies, collaboration, assessment techniques and educative materials for teachers, can promote deep understanding of the concepts and inquiry strategies (Schneider & Krajcik, 2002). Thijs & van den Berg (2002) find in their study that the impact of the materials in changing the teaching practice is only effective if the essential characteristics of the specific innovation are clearly incorporated in the materials

3.2. DESIGNING A CURRICULUM

To be able to understand the problems Pratham is having with the design process of its curriculum materials an overview of relevant literature on curriculum design is presented. This literature is organized into three different parts in this chapter. These parts are corresponding to the main elements of systematic curriculum design: the analysis, design and evaluation. These element correspond and overlap. The approaches described in the section of the design, also influence the analysis. Nevertheless this arrangement is chosen to present the relevant theories on systematic curriculum design.

3.2.1. Analysis

Analysis in the curriculum domain is conducted to understand how to target a design (McKenney et al., 2006). During this analysis phase the earlier described characteristics of a curriculum are used. The characteristics which are analysed are the levels of a curriculum, the representations and the alignments of the curriculum with the teacher development and pupil assessment

The levels of a curriculum are analyzed by looking at the internal consistency. The macro, meso, micro and nano level should be consistent with each other. The representations of the curriculum should be in harmony with each other. The intended-, implemented- and attained curriculum are analyzed. Also the coherence between the systems is analyzed. The teacher development and the pupil assessment should be coherent with the curriculum. Also important is the usage of inputs beside these three aspects. McKenny et al. (2006) mention that “inputs such as creativity, inspiring examples” are also important during the analysis phase. Analysis often includes conducting a needs assessment (Rosset, 1005), identifying a performance problem, and stating a goals. A good analysis is characterized by a systematic approach. To conduct an analysis during the design of curriculum materials is relevant to the needs of Pratham because in the current situation the design team isn’t aware of how to target the design of the materials.

3.2.2. Design

Most of the curriculum design efforts precede informally, following no set, systematic procedure (Doll, 1995). The supposed shortcoming of informal approach has prompted thoughtful observers to devise more systematic design approaches (Doll, 1995). Beside the systematic design approaches other important issues from literature are described in this section. Design paradigms are described to understand the how some decisions are made, what the values about the product (the curriculum materials) and the process are. To better understand the problems Pratham is having with the piloting of the materials, prototyping is adopted in this section.

Approaches

In educational design there are three dominant approaches (van den Akker, 2003; March & Willis, 2003). These approaches are the planning-by objectives, the deliberative approach and the artistic approach.

The planning by objective approach is made by Tyler. Tyler contends there are only four big questions that curriculum makers have to ask (see table 3.3). These questions are concerned with selecting objectives, selecting learning experiences, organizing learning experiences, and evaluating (Posner, 1995).

Table 3.3; Tyler's planning by- objectives approach (source: March & Willis, 2003)

1. Objectives What educational purposes should the school seek to attain?
2. Selecting learning experiences How can learning experiences be selected that are likely to be useful in attaining these objectives?
3. Organizing experiences How can learning experiences be organized for effective instruction
4. Evaluation How can the effectiveness of learning experiences be evaluated.

Walkers' approach is called the deliberative approach and is the second major approach described. Walker (1971) states that developers of a curriculum doesn't begin with a 'blank state'. They have their individual beliefs and values. They have their own perceptions of the task, ideas about what the chief problems are, assertions about what should be prescribed, and commitment that they are prepared to pursue and argue about (March & Willis, 2003). Walker is studying what people actually do in developing curricula. He assumes that better curricula will result when those engaged in it follow the somewhat rarefied logic he identifies; that better curricula will result when those engaged in it understand the complexity of the process. This approach for a generic curriculum design is rooted in Schwab's naturalistic approach (Visscher-Voerman, 1999). Walker identifies three basic phase which he termed "platform", "Deliberation" an "design". Walkers model is less linear than Tyler's and relegates objectives to a less central position in the curriculum development process (Posner, 1995).

The third major approach is the artistic approach developed by Eisner. Eisner believes that we need theory that does recognise the artistry of teaching (March & Willis, 2003). At first glance, the approach of Eisner is quite similar to the steps that Tyler advocates, but the underlying rationality and the practical emphases are quite different (Eisner, 1972), especially the mode of presentation and the evaluation procedures that Eisner suggests (March & Willis, 2003). An interesting distinction is made by Eisner

considering the purpose of learning. He makes a clear distinction between aims, goals and objectives. An aim provides the general direction, goals more specific statements, and objectives to be the most specific statements (March & Willis, 2003).

Prototyping

To better understand the problems Pratham is having with the piloting of the materials, attention is being paid to prototyping. According to Smith (1991) a prototype is a “preliminary version or a model of all or a part of a system before full commitment is made to develop it. In this definition, the term develop refers to the construction of the final product. Prototypes are all products that are designed before the final product will be constructed and fully implemented in practice. There are three significant characteristics of prototyping, these are extensive use of prototype, a high degree of iteration and participation of representatives or the target group (Nieveen, 1999). The first characteristics of prototyping is the extensive use of prototypes. Extensive use of prototypes, according to Smith (1991) prototypes may be used in two ways. On the one hand, a prototype may be continually refined and evolve towards a final deliverable. Smith refers to this approach with the term evolutionary prototyping. On the other hand, developers may design throw- away prototypes. This kind of prototype clarifies possible consequences of specific design ideas. After being evaluated, a throw-away prototype will be discarded and its evaluation results are taken into account in a next prototype.

The second characteristic is the high degree of iteration. Compared to the provision of abstract specifications, the use of a series of concrete prototypes may provide a better foundation for identifying the requirements of the support system in interaction with members of the target group, expert, and other groups. Formative evaluation of prototypes is a crucial part of each prototyping process. It gives participants of the evaluation as well as the developer of the prototype insight in the potentials of the design. Results of the formative evaluation may lead to revision of the prototype and adaptation of the specifications that underlie the support system. In this way, each prototyping cycle represents the evolution of intentions of the system (Nieveen, 1999). Another important characteristic of iterative development approaches is the notion of ‘think big’ but start small’. By first trying to develop a small part of the final system, one keeps the development process manageable and one can learn from failures and apply successes when developing the next parts.

The third characteristic of the use of prototypes is participation of representatives of the target group. When applying a prototyping approach, the participation of members of the target group is of paramount importance (Nieveen, 1999). It requires access to people typical of those who will actually use the design, not their representatives or management. More user involvement may lead to (Moonen, 1996; Schneidermand, 1992):

- More accurate information about the tasks which will be supported
- Better opportunities to negotiate and justify design ideas
- Increase of user commitment and ownership of the final deliverable
- Stimulation of the professional development of the participants
- Changes in the work environment of the participants

In addition, developers have a strong tendency to design for themselves (Monk et al, 1993) Because developers of a support system may have different backgrounds than those of the target group, the prototyping approach gives the designer insight in the target group. The understanding of the use, and the characteristics of prototypes is

relevant for the needs of Pratham because these theories can be included in the systematic design process so that the current situation of Pratham can be improved.

3.2.3. Evaluation

Evaluation plays a big role in Pratham, while aiming at using evaluation as a strategy to improve the product, the character of the evaluations is primarily summative. The organization is, without knowing conducting summative evaluations instead of formative ones. While using evaluation as a strategy to improve the product, the organization is, without knowing conducting summative evaluations instead of formative ones. To better understand the problem Pratham is having with evaluations, literature is presented that pays attention to the characteristics and the distinctions between summative and formative evaluation.

Cronbach (1963) made a plea for the inclusion of evaluation in program design: “Evaluation, used to improve the course while it is still fluid, contributes more to improvement of education than evaluation used to appraise a product already placed on the market. Scriven (1991 in , Maslowski & Visscher, 1999) used the term ‘formative’ to distinguish between the evaluation of a program during its developmental stages and the processes involved in determining the effectiveness of a program after its completion, which he labelled ‘summative evaluation’.

Summative evaluation are performed by, or commissioned by persons or institutions who intend to use the evaluation findings to determine the impacts, outcomes or results of a particular program. Summative findings may, for instance, be used to decide whether or not to purchase a new teaching package, or to decide whether an innovation project should be continued or not (Scriven (1991 in , Maslowski & Visscher, 1999) formative evaluation on the other hand, is intended to support the process of improvement, and normally commissioned or done by, and delivered to, someone who can make improvements. “Formative evaluation is aimed at determining the strengths and weaknesses of an educational program” (Maslowski & Visscher, 1999) It is an integral part of the developing process. It provides feedback for the planning and producing an educational program. Although formative and summative evaluations differ in their purpose, both are concerned with determining the merit and worth of a program. Merit stands for context-free value of a program. Whereas the worth of a program is concerned with its context determined value. There are different methods that can be used for formative evaluations.

George and Cowan (1999) make five different groups of methods used for this evaluation based on the information the method does obtain. The groups of methods are

- The immediate learning experience (e.g. Self confidence survey, journals, diaries, self review)
- Students’ reactions that occurred during the learning experience (e.g. Interpersonal process recall)
- The success of learners in achieving the intended learning outcomes (e.g. concept mapping, analysis)
- The students reactions after the experience (e.g. Questionnaires, interview, ‘not-quite’-rounds)
- To identify topics that merit further evaluative enquiry (e.g. Nominal group technique) (George & Cowan, 1999).

3.3. IMPLEMENTATION OF CURRICULUM MATERIAL

The current of implementation process of the curriculum material is not leading toward an adoption of the materials by the un(der) qualified educators in slums. To better understand why this problem occurs and why the current process it not leading to adoption of the curriculum materials relevant theories on implementation is presented in this chapter. From literature we can see that the problems Pratham is experiencing can be explained by two aspects of implementation. These are: The factors of implementation in India that determine the degree of adoption and the strategies used for the implementation of the materials. Also exemplary curriculum materials play an important role in the implementation process. The literature on exemplary curriculum materials is presented in combination with the characteristics of curriculum material in chapter 3.1.2.

3.3.1. Implementation factors

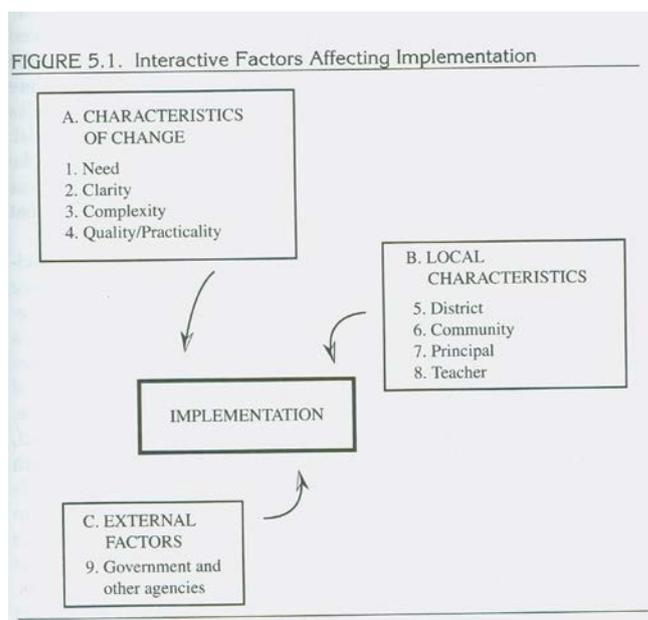
Given the complexity of the phenomenon of implementation, the factors that could plausibly influence it are potentially enormous in number. Yet more and more, the evidence points to a small number of key variables (Fullan, 2007). Although the uniqueness of individual settings, and variations in local capacity, make successful change a highly complex and subtle social process (Fullan, 2007).

Factors affecting implementation

There are nine critical factors organized into three main categories relating to implementation

1. The characteristics of the innovation
2. Local roles
3. External factors

Figure 3.2; Factors affecting implementation (source: Fullan, 2007).



Because of the specific context of Pratham (e.g. un(der) qualified teachers, NGO-heads, slums) the problem Pratham is experiencing with the implementation of its curriculum

materials is important to elaborate. This problem is mainly caused by the factors from the second category described by Fullan (2007), the category of local characteristics. The factors of the community, teachers and principal will be further elaborated in the next section to get a better understanding of the challenges of Pratham and the eventual guidelines that can be derived from these theories.

Teachers:

In the factor of the role of the teachers, both the individual teacher characteristics and collective or collegial factors play role in determining implementation (Fullan, 2007). Some teachers, depending on their personality and influences by their previous experiences and stage of career, are more self-actualized and have a greater sense of efficacy that bring about the success of implementation (Fullan, 2007). The teachers are of great importance in the implementation process. They are the key to successful curriculum implementation (Tamir, 2004). There is a strong relation between the beliefs of the teacher about the effectiveness of the materials and the effectiveness of the implementation process. Also a lack of teacher knowledge determines the effectiveness (Lloyd & Wilson, 1998). Teachers find the time required to understand the curriculum materials and the changes that needs to be made in the teaching practice the most difficult part of the implementation process (Peers, Diezman & Watters, 2003). Yagi (2006) finds that teachers often lack confidence in classroom management (Yagi, 2006) and because of this, the implementation of the innovation becomes harder. Extra support is necessary to enable teachers to build up their motivation, confidence and skills to engage in teaching (Yagi, 2006). It is important to make sure that during this support, the background of the teachers is taken into account and the language of the curriculum is adapted to the teachers (Shkedi, 2006).

The principals (NGO-heads):

The role of the NGO-heads of Pratham can be compared with the role of a principal. The principals strongly influence the likelihood of change, but research also indicated that most principles do not play instructional or change leaderships roles (Fullan, 2007). The principle is the person most likely to be in a position to shape the organizational conditions necessary for success, such as the development or shared goals, collaborative work structures and climates, and procedures for monitoring results (Fullan, 2007). There is a strong relationship between the style of the principal and the degree of implementation of the curriculum materials. (Hord & Hall, 1987). Also the vision of the principal plays an important role in the implementation process. The school leaders vision and understanding of the materials influence the effectiveness of the process (Yuen, Law & Wong, 2003). When a principle doesn't have high expectations of the materials, it is likely that the implementation process is not effective (Leithwood & Montgomery, 1982)

Community

Communities are of great importance when talking about the effectiveness of the implementation of curriculum materials. Research on the role of the community in this implementation process has proven that when communities do not like the innovation they see in the schools painful situation will (Gold & Miles, in: Fullan, 2007). In slums the community plays an important role. Besides the opinion of the community about the

materials also other community aspects play an important role for the implementation of the materials.

Organizational aspects of education that are successful in slums are that there are no rigidly defined classes but only loosely formed “samoohs” (groups) based roughly on age and ability (Khullar & Menon, 1996). Another success is achieved by acknowledging that it takes processes of trust building and negotiation within the neighbourhood and the community of the slum (Khullar & Menon, 1996). Besides this, ‘Mahila samoohs’ (women's groups) are an important actor in the success of slum education. In addition, there needs to be an ongoing communication with the parents, partly to strengthen the community participation. Community participation is not only of importance for the daily practice of education, but also in leading to sustainability of education in slum areas. This participation is the most important factor of success of an educational project after the external funding stops. (Nkansa & Chapman, 2006). The content of the education needs to be interesting and activity-oriented, therefore their own cultural milieu needs to be the basis of the curriculum (Khullar & Menon, 1996). Finally, Chickermane (1979; in Nkansa & Chapman) proves that success could be achieved through past-time education for 'out of school children'

McDermott and Rothenberg (1999) have carried out research on effective urban teachers, which indicated that teachers who loved the children, sustained and nourished the motivation of the students were most successful and loved by the children. In addition, these teachers were very enthusiastic about their job. Teachers need to be culturally responsive and community connected as essential qualities of effective urban teachers (McDermott & Rothenberg, 1999). Teachers should be willing to invite parents and involve them, they should have high expectations of the children they are teaching, and they should be able to connect the children's cultural background to the classroom learning.

3.3.2. Strategies of implementation

The challenges of Pratham can be explained by the strategies used for the implementation of curriculum materials. Although strategies of implementation are invented and used frequently, there has not been much research into the effectiveness of the strategy used. There is not much proof of successful implementation strategies. Four strategies seem to work in different contexts. The first is the in-service training. In a review, Fullan and Tromp (1983) describe: “It appears that intensive in-service training is an important strategy for implementation.” This strategy provides the teacher with both demonstration models and experiences. In addition, psychological reinforcement conducive to resocialisation is being practised in this method. Fullan and Tromp (1983) are not completely convinced about the success of the method though; they write that there are still too many questions, which are not answered yet. Mainly about the nature of the training, how much structure is needed and questions about the characteristics of good trainers. Another implementation strategy is resource support. Resource support concerns the provision of time and materials. In addition, other facilities during implementation are supported. This strategy seems to be an important aspect when implementation of education takes place. Feedback mechanisms are the third strategy Fullan and Tromp (1983) discuss. This strategy identifies the nature of the interactive network during implementation. In short, since problems during initial implementation are probably inevitable when any serious social change is attempted, feedback mechanisms are essential. Participation in the innovative process by those who

are expected to implement the new programme is widely thought to be an effective strategy, and of paramount importance.

An additional strategy, the regularity and support strategy, can be found in the work of Yagi (2006). This research proves that implementation, when working with volunteers (which is the case for Pratham), is mainly about regularity and supporting the innovations. However, the volunteers face difficulties in asking for support (Yagi, 2006). Also micro-teaching is an important strategy while implementing curriculum material. Experiences provide educators with a number of benefits: first, it exposes educators to the realities of teaching; second, it introduces teachers to their roles in practice, third, it helps them to see the importance of planning, decision making, and implementation of instruction, fourth, it enables them to develop and improve teaching skills and, finally it helps them build their confidence for teaching (Subramaniam, 2006) Another strategy that seems to be working well with educators with minimum schooling is what Schwartz (2007) calls the rehearsal curriculum. A rehearsal curriculum is written in a way that prepares teachers for the teaching experience by prompting them to go through the same process of learning that will be used in the classroom. In other words, a rehearsal curriculum allows the teacher to work through a three-part process of learning as a 'rehearsal' for leading students through the same process (Schwartz, 2007). Where strategies and tactics refer to the methods employed to introduce and implement innovation, successful implementation basically involves the re-socialisation of a key actor. Therefore, strategies that support and facilitate this process are the most relevant ones to consider.

3.4. CONCLUSION

The presented literature in this chapter centres around the three core ideas behind this study. These ideas relate to the areas of curriculum materials, design of curriculum materials and the implementation of these materials. As said before, there is a strong link between these three areas. If the materials aren't of good quality it is most likely that the implementation of these materials is going to give some problems. Also the design process of these materials will determine the quality and characteristics of the materials. This can be made explicit by looking at an example. The choices made during the design process determine the characteristics of the materials. For example harmony between the representations of the curriculum is created by making sure that there is not much variety between the intended and the attained curriculum, this can be reached by using a prototypes during the design phase. Also the implementation process is an interrelated area. When considering the representations of the curriculum, the way the implementation is shaped determines the attained curriculum. The harmony between the representations of the curriculum is also depended on this particular process.

3.5. IMPLICATIONS FOR THE STUDY

When combining the literature of the three areas described, the following implications for the study can be formulated.

Implications for the research and the design based on literature on curriculum materials are:

-The research must analyse the consistency between the different levels of the curriculum, in order to improve the quality of the materials. The design must have consistency between the different levels

-The research must analyse the harmony between the curriculum representations. Insights in- and the development of this, harmony will make a contribution to the quality of the materials. The design must have harmony between the curriculum representations

-The research must analyse if the components of the curriculum material are interrelated and carefully chosen. Creating consistency between these components will lead to more quality. The components of the design must be consistent.

Implications for the research based on literature on the design of the material are:

-The research must analyse if the design process is shaped in a systematic order. This to be able to design good quality materials.

- The research must analyse the current understanding, and usage of the prototypes in order to design a usage that will gather the most information from the target audience as possible.

-The research need to analyze the current form of evaluation, in order design an type of evaluation that suits the needs of the situation and the organization.

Implications based on literature on the implementation process of the material are:

-The different factors that determine the effectiveness of the implementation process need to need to be analyzed, in order to design a process that is effective in the context of Pratham

-The research need to analyze the current strategies used. In order to design a implementation process for the materials in which the un(der) qualified educators can adopt the materials in daily practice.

3.6. RESEARCH QUESTION

The literature offered on the three related areas, the characteristics of the curriculum materials, the design process and the implementation process combined with the implications for the study can contribute to the challenges of Pratham. The aim of this research (in the form of a formative evaluation) is to answer the following research question: ***“What should be the characteristics of curriculum materials for use by un(der) qualified educators in the slums of India, and how should the design and implementation processes be shaped?”***

4. RESEARCH METHODS

4.1. RESEARCH DESCRIPTION

From the main question we can see the need to explore the materials, the design process and implementation process of Pratham. To be able to understand the characteristics of these three areas a way to categorize these characteristics was chosen. The categories that are used to understand the characteristics are the quality criteria (validity, legitimacy and efficacy).

This implies that the quality criteria are not only used for the materials used, but also to categories findings on the design- and implementation process. To be able to use the criteria for all three areas, first the criteria needed to be operationalized. This was done for all three areas (see table 4.1). When the main research question (“What should be the characteristics of curriculum materials for use by un(der) qualified educators in the slums of India, and how should the design and implementation processes be shaped?”) is combined with the quality criteria the following sub questions can be formulated.

Table 4.1; Operationalization Quality criteria

		Characteristics Materials	Design process of materials	Implementation process of materials
Viability	Practicality	Is the material realistically usable in everyday practice for both the un(der) qualified educators and Pratham?	Is the design process realistically usable in the context of the organization and leading toward practical products?	Is the implementation process realistically usable for both the teachers, their trainers and the organization?
	Relevance	Are the materials relevant to the needs and wishes of the children in slums, their parents and Pratham?	Is the design process relevant to the needs and wishes of the design team and Pratham?	Is the implementation process relevant to the needs and wishes of the teachers, their trainers and the organization?
	Sustainability	Are the materials physically robust; the activities embedded in the material will still be possible once initial support fades?	Will the design process still be possible within Pratham, once external support and encouragement are withdrawn?	Can the implementation process during pilot activities be scaled to suit the broader target audience?
Legitimacy	Contemporary scientific insights	Is the rational behind the materials based on theories on levels, representations, coherence, components, curriculum artifacts and quality criteria of curriculum material?	Is the rational behind the design process is based on the theories of systematic curriculum design, the design paradigms, prototyping and formative evaluation of the curriculum material?	Is the rational behind the implementation process is based on the theory on factors and strategies of implementation of curriculum material
	Consistency, harmony & coherence	Are the materials internally and externally consistent; is harmony and their is coherence among the system factors?	Is the design process internally consistent and does it draw attention to external consistency?	Is the implementation process internally consistent and does it draw attention to external consistency?
Efficacy	Yield desired results	Do the materials correspond with the desired results of the un(der) qualified educators, parents, state of Gujarat and the organization?	Does the design process correspond with the desired results of the team as well as the organization?	Does the implementation process corresponds with the desired results of the un(der) qualified educators, trainers and the organization
	Cost benefit ratio	Are the materials worth the cost, time and efforts which were made. The materials are efficient; they match all quality criteria	Is the design process worth the cost, time and efforts which are made? Is the process efficient; materials can be designed which match all quality criteria?	Is the implementation process worth the cost, time and efforts which are made? Is the process efficient; the materials are implemented in such a way that their characteristic match all the quality criteria?

To retrieve data on these sub questions a combination of design and evaluation is conducted. The study consists of three phases. The analysis phase (formative evaluation of the present material, the process and the implementation process), a design phase and an evaluation phase.

First an analysis of the current material, design process and implementation process is performed. During this analysis the researcher had the role of participant/observer. The data derived from this analysis is used as input for the (re)design. During the design phase the researcher had the role of facilitator. After the design, an evaluation is conducted. This evaluation also focuses on the three area of the research: the materials, the design process and the evaluation process of Pratham.

The data is gathered simultaneous with the activities of the design team (NOS-team) of Pratham. The NOS-team is designing 3 different trunks (curriculum material), in a time period of 1.5 month. The design of the implementation process is not performed by the researcher. This is due to the fact that this process is too much interweaving with the promotion track of drs. Harini Raval who is doing conducting a research on professional development of the DLC heads. Because of the already mentioned strong link between the areas of implementation and the design of the materials, the researcher had the role of discussion partner in the decision-making about the design of the implementation process. Te vaag. Ook hier nogmaals stilstaan bij wat ik nu precies doe. Ook vertellen dat ik doorga op bestaande producten en processen

4.2. RESPONDENTS

In order to collect the data on the sub questions during the analysis, the design and the evaluation phase of the research the following respondents were invited to contribute to the research. The respondents were selected on the basis of their function within the organization, their knowledge and their experiences. The groups of people that will be approached for the data collection during the analysis and the evaluation phase will be: NGO-heads , DLC-heads, members of the management team, the NOS-team, teachers (educators), parents and children.

NGO heads are the heads of a district with Pratham's school. One district fosters about 10-15 DLC's. The opinion of the NGO head on the characteristics of the material is useful because of their experience with the DLC's. Due to this experience they can say much about the viability of the materials. Additionally due to their role in the shaping of the implementation process it is important to understand their opinion on the attainability of the process. Ten NGO-heads were involved during this research.

The heads of Pratham's schools are called DLC heads. Their opinion on the practicality materials is very useful because they have experience with the implementation of the old materials; additionally they are the target audience for the materials, they will implement the materials and will work with them in the future, it will be necessary to understand their perceptions of the characteristics of the materials as well as the factors of implementation. Six DLC-heads were involved in this research

In the management team of Pratham different people are involved. These are Aditya (the director of Pratham Gujarat). Besides the director different program leaders are in this team. These Program leaders have at least 3 years of experience with the organization in different program. Also the financial cluster of Pratham Gujarat is included in this team. The opinion of this group of people on the materials, the design process and the implementation process is useful because they represent the organizations mission. They are able to judge the quality of the materials on the aspects

of efficacy and yield desired results. Additionally due to their wider horizon their perceptions of legitimacy and viability will be interesting to include. The data derived from this group is coming from seven different people.

The design team of the curriculum materials is called the NOS- team. Their opinions on the design process are useful because based on their experiences a new process can be designed. Also their perceptions on good quality materials are of importance to include in this research because they have to actually design the materials. The NOS-team consists of approximately ten people.

The group of ‘related people within Pratham’ are co-workers that are working for Pratham on different projects but have experience with the field and the educational setting. Their opinion on the quality of the materials are useful because they visit the DLC’s regularly and the DLC heads have the feeling they can talk freely on this research with them. Also their experience with slum children and the DLC’s makes it interesting to include these people in the research. 5 people were included from this group.

The teachers of Pratham are un(der) qualified. Their ‘official’ name within the organization is ‘Balsaki’. Balsaki literally means ‘the friend of the child’. The opinion and the characteristics of these educators are necessary to understand because they actually work with the materials. They also have some perceptions on practicality, relevance and desired results. The data of 14 Balsaki’s is used in this research.

The opinion of the parents of the children in the DLC’s are useful because of the fact that they have all kinds of expectations on the quality of the materials. Besides this they are important stakeholders in the future. This because when the allowance stop (in 1 year) the parents have to pay for the curriculum materials designed from Pratham. Additionally it is necessary to understand their perceptions of the desired results.

Table 4.2; Respondents

Respondents	Characteristics of the material	Design process of the material	Implementation process of the material
NGO-heads	•		•
DLC heads	•		•
Management of Pratham	•	•	•
NOS-team	•	•	
Related people within Pratham	•		
Teachers	•		•
Parents	•		
Children	•		

4.3. INSTRUMENTS USED

In order to collect the data on the sub questions during the analysis, the design and the evaluation phase of the research the following instruments are used; Interview schema’s, Focusgroupdiscussion, classroom observation schemes, logbooks, documentation analysis by the use of checklists and daily notes of the teachers.

4.3.1. Interview schemes

Interview were held to gather data during the analysis phase and in the evaluation phase of this research. Mainly data on the characteristics of the material were gathered in interviews. A total of 27 people were interviewed. Some of these people were

interviewed multiple times to get a better understanding of the data or to triangulate the data. The interviews were held with different respondents.

For the a better understanding of the characteristics of the materials, the DLC heads, NGO heads, the Balsaki's and children were interviewed and also the management of Pratham. For the research area of the design process of the materials, the focus slightly moved towards the design team, the management of the design team and some co-workers of Pratham who have insight on these processes.

The interviews held to gather data on the implementation process of the materials were mainly with the designers of the process, the management and the teachers. Before the interviews were conducted the interviews were translated and tested on validity and reviewed by one of Pratham's members.

The interviews used were structured, making use of open-ended questions. This to be able to gather as much information as possible. Some interviews needed to be translated into Gujarati, after this an extra round of reviewing was done, to get a clear picture of the nature of the questions. The interviewers were instructed on how to conduct an interview and how to gather and process the data.

4.3.2. Focus group discussion schemes

Focus Group Discussions [FGD] were held to gather data in the analysis phase and in the evaluation phase of this research. To gather data, FGD were held for all three research areas. The FGD's were held with the following respondents: NGO heads, the NOSTeam and the Balsaki's. In front of the discussion time was spend to introduce the procedures and goals of the discussions.

The focus group discussion used were partly structured. Every discussion started with some practical guidance on how to discuss. After this the topics of the discussions were presented, this to create a common understanding on the focus of the discussion. Sometimes if the atmosphere was not open enough as an introduction people were asked to tell them why they were put together in this discussion. Questions were formulated to keep the discussion going. The topics were discussed one by one and the discussion was ended with a short summation of the findings, and the notes made by the researcher were discussed. After the discussions the summary was studies to be able to identify major and minor themes. Some of the discussions were in Gujarati, this is why some of the discussions needed to be translated, after the translation a review was done to check the meaning of the questions, also the discussion leader was instructed for these discussions

4.3.3. Classroom observation schemes

To gather data on the characteristics of the material and the implementation process, during the analysis and evaluation phase of this research, classroom observation schemes were developed. In order to get a good understanding of the curricular materials 6 DLC's were visit in different Slum areas in Ahmedabad. Also some of the observations took place in Vadodara, where the materials also were implemented. The observations took place in different religion communities, with different Balsaki's. The observation schemes made are based on the concepts from the literature (e.g. curricular spiderweb, coherence, factors of implementation). Before the data was gathered first a review of the instruments happened. The logical test were checked and the relevance for the design process was considered. The schemes were filled during the observations. After the observations a summary was made of the findings. These summary's were put together and an interview was conducted to better understand the observations.

4.3.4. Team logbook

A logbook was kept during the design phase of this research. Data was gathered in this book on the characteristics of the material as well as on the design process. The logbook belonged to the NOSteam with the researcher as editor. The logbooks used for research are semi structured. The concepts derived from literature are important to structure these data sources, but also minutes and more organically organized information are included in this document. In this logbook all kinds of data were gathered. Minutes of meetings, design criteria, different prototypes, reports of the formative evaluations or reviews, reports on material search, or even the process description of the development of the trunks was documented. Three different Logs were kept during the research.

4.3.5. Documentation analysis; checklists

To gather data on the characteristics of the material, Two different checklist are developed for the analysis of 5 trunks (the three current trunks used for this research included). One checklist during the analysis phase, and one during the evaluation phase. Both checklist are based on literature, using the different aspects of the quality criteria. With the use of the checklists the materials made were analysed before new design criteria were formulated. These checklists give an overview about the gaps and how to provide gap closure. Also these instruments were used to evaluate the completeness of the materials. The data gathered with the checklists on the different curricular materials were summarized and compared to each other to be able to get a grip of the big picture of the gaps and needs

4.3.6. Documentation analysis; daily notes

To gather data during the design and evaluation phase on the implementation process of the materials daily notes are used. These notes were made by 14 Balsaki's who were implementing the curricular materials. The daily notes used for the research are structured. They were asked to reflect in their daily notes on the aspects of the materials that stimulated good implementation and on the aspects that hinder the implementation process. Also they were asked to reflect on their difficulties with the curricular materials. After the implementation period of the curricular material, the daily notes were summarized. Major and minor themes were identified.

Table 4.3 shows the usage of these instruments during the research. The three phases (analysis, design and evaluation phase) are all divided into the three research areas, the characteristics of the material, the design process of the material and the implementation of the material

Table 4.3; Matrix of instruments

Instruments	Analysis			Design			Evaluation		
	Characteristics of material	Design process of material	Implementation of material	Characteristics of material	Design process of material	Implementation of material	Characteristics of material	Design process of material	Implementation of material
Interviews	•	•	•				•	•	•
Focusgroupdiscussion	•	•	•				•	•	•
Classroom observation scheme	•						•		•
Team logbook				•	•				
Documentation analysis; checklist	•						•		
Documentation analysis; daily notes						•	•		•

4.4. DATA ANALYSIS

To be able to analyse the data, qualitative methods were used. The data was categorized by theme. This was done after the usage of each instrument. The notes were analyzed and compared to identify issues which needed more clarity or to state that there is enough confidence on this evidence.

Also the notes were compared by searching for emerging patterns and themes. The data was organized into different theme's and categories. These themes were drawn from the major point that derived from the research questions, and the literature. To care for the quality of the data analysis triangulation was used, the points to be proven or patterns which occurred were investigated further by using different sources of evidence. Sometimes literature was used to triangulate, but the accent of triangulation was to use other groups of respondents. Additionally, logical tests were used to care for the quality of the analysis; trustworthiness, credibility, confirmability and data dependability. To make these procedures concrete four tests which are commonly used to establish quality (Yin, 2003) were taken into account, while designing the research. These four test are: Construct validity, internal validity, external validity and reliability. Two steps were taken while creating construct validity. The first was to select the specific types of changes that are to be studied (and relate them to the original objectives of the study). The second was to demonstrate that the selected measures of these changes do indeed reflect the specific types of change that have been selected.

5. THE SHAPE OF THE DESIGN

This chapter presents the designs made during the study. The characteristics of the designed material, the shape of the design process and the implementation process are presented. All designs are based on the findings of the analysis in chapter six. The output from the performed analysis is used as input for the design. The characteristics of the designed curriculum material are presented in the form of the design criteria. In chapter six one can find which of the characteristics don't meet the criteria yet, or are not sufficient yet. The shape of the design process and the implementation process are described in 5.2 and 5.3.

5.1. CHARACTERISTICS OF THE MATERIAL

Based on the output of the analysis (chapter 6) of the present curriculum material of Pratham, design criteria were formulated by the NOS team. The researcher facilitated this process. The criteria are divided into eight different groups. The overall trunk guidelines, the intended learning objectives, the activities, assessment, materials, and three groups of criteria that focus on the teacher guidance.

Overall trunk guidelines

- The trunk is less expensive than Rs.3000/-
- The written content of the trunk is well formulated (easy to understand)
- The content of the trunk is organized in a logic way (sequencing etc)
- The trunk can be used for next 3 years
- The content of the trunk is self explanatory

Intended learning objectives [ILO]

- The ILO's are SMART
- The ILO's are complete to teach the subject matter
- The ILO's are exiting for children to engage with
- The ILO's are well formulated (A,B,C,D & easy to understand)

Activities

- All activities are guided with an activity card
- All 6 taxo's of Bloom are covered throughout activities per concept/
- The activities are exiting for the children
- 60% of the activities are group activities
- The activities are relevant to the ILO's
- The activities are consistent with the ILO's
- The activities are complete to fulfill the ILO's
- All activities can be conducted during 30 days
- The individual activities can be done within the given time
- The activities are self-explanatory
- All activities are sequenced in a logical way

Assessment

- The assessment of the trunk contains a pre-test, post-test, datasheet (collation) and guidance for the teacher on the use of the tests as well as a summary of the level of the child
- The assessment is valid (measuring what it wants to measure)
- The assessment is exiting for children
- The assessment is consistent/complete with the ILO's
- The assessment is complete when it comes to the ILO's
- The assessment is consistent with the concept
- The assessment is consistent with the age group of the children.
- The assessment is easy to use for the teacher
- The assessment can be done within the given time

Material

- The material in the trunk is safe
- The material in the trunk is easy to handle for the teacher
- The material used outside the trunk is easy available in every DLC
- The material in the trunk is of low cost
- The material in the trunk is exiting for the children
- The material in the trunk is easy to relate to for children
- The material in the trunk is consistent with the activity
- The material in the trunk can be prolonged to the next 3 years

Teacher guidance: Activity cards

- The activity cards contain a page number, title, the ILO, the time, materials, activity steps, notes for the teacher, do's & don'ts, and differentiation tips.
- There is one (!) activity card for each activity
- The activity cards are well formatted (easy to understand)
- The activity cards look attractive

Teacher guidance: General cards

- The general card contain a index for the curriculum, an index for the material, an index for the assessment, a general card on grouping, a general card on learner centered education
- The general cards are well formulated (easy to understand)
- The general cards look attractive

Teacher guidance: Extra reading materials

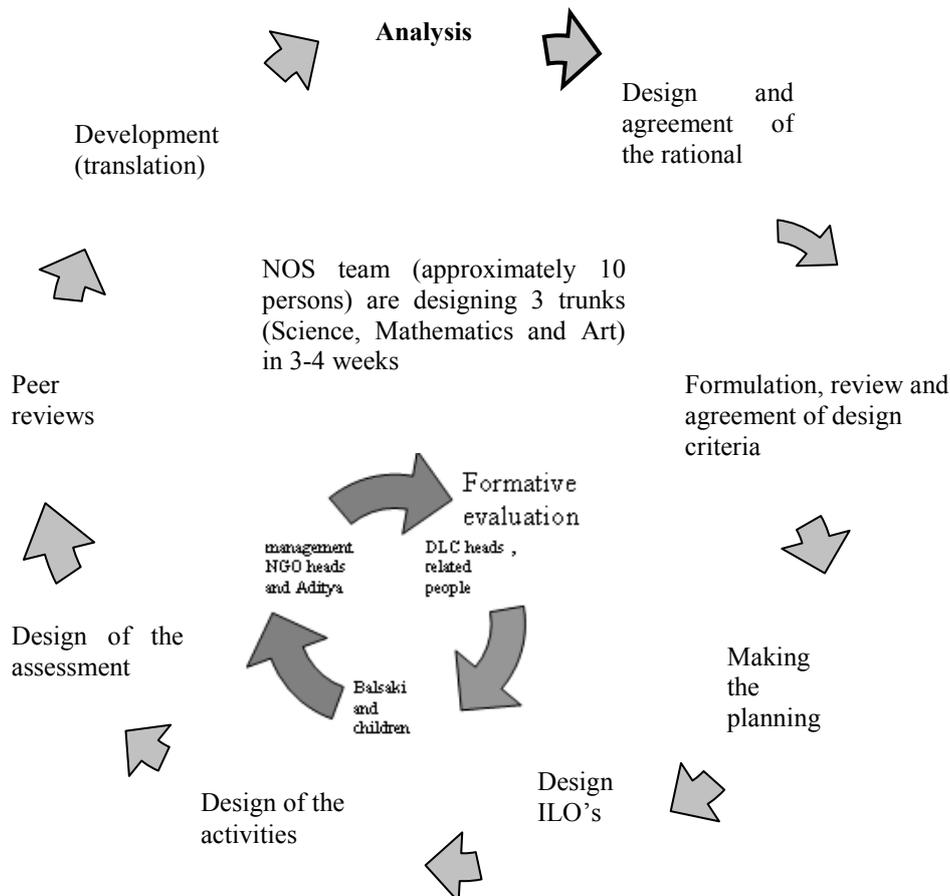
- The extra reading materials in the trunk contains extra information for the teacher on the subject matter for science; Math & Biology
- The extra reading material is made attractive & easy to relate to for the teacher
- The extra reading material is well formulated (easy to understand)

5.2. THE SHAPE OF THE DESIGN PROCESS

After an analysis of the current design process of the curriculum materials a new design process was created. The shape of the process is based on the findings presented in chapter six. The process created for Pratham consists of eleven activities (see figure 5.1). These design activities are analysis of the needs for the curriculum material, the design and of the rationale and agreement of all parties involved. The third step is the formulation, review and agreement of the design criteria (see 5.1). The fourth activities is to make the planning, this planning contributes attitude of the NOS team in order to word systematically. The fifth activity is the design of the ILO's (See 5.1). Based on the Intended learning outcomes activities are designed that are in balance with the rationale and strive for internal consistency (see 5.1). the design of the assessment is the next step in the process. Formative evaluations are an important aspect of the new design process (see chapter six, findings). The emphasis of these evaluations during the process was on the steps of activity- and assessment design. Three groups of people were invited for these evaluations. The DLC-heads in combinations with the related people, the Balsaki's in combination with the children and the management in combination with the NGO heads. Before the design cycle ended and the material was translated and developed everyone of the NOS team was invited to peer review other trunks

Figure 5.1; The design process

5.3.



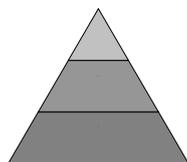
THE SHAPE OF THE IMPLEMENTATION PROCESS

The design of the implementation process is not performed by the researcher. This is due to the fact that this process is too much interweaving with the promotion track of drs. Harini Raval who is conducting a research on professional development of the DLC-heads. Because of the already mentioned strong link between the areas of implementation and the design of the materials, the researcher had the role of discussion partner in the decision-making about the design of the implementation process.

Prioritization session

Before the implementation process started a prioritization session was held in order to work upon the ‘real’ problems of implementation. The DLC heads all felt that the classroom management were causing major difficulties in daily practice. These difficulties were caused by the innovative child-centred approach and the grouping of the children. The management on the other hand wanted the implementation process to focus on consistency between the intended, implemented and attained curriculum. Additionally there wanted the DLC heads to focus on the content on the trunk (because the science trunks scared most of the DLC heads) During the session a triangle needed to be filled with problems that were urgent and important to solve and to learn more about.

Figure 5.2; The prioritization triangle



Micro teaching sessions

The major activity of the implementation process are the micro teaching sessions. These are sessions in which the DLC heads and Balsaki's come together at one DLC to prepare (under the leading of the NGO heads) for the activity of the next day. All DLC heads had to prepare for the session, only one DLC heads actually gave the lesson. In this lesson the actual activity took place. Feedback was given on difficult aspects of the activity as well as on content difficulties. Additionally feedback was provided on the teaching skills of the teacher. Question were asked if the approach was child centred and were the classroom management difficulties were expected.

Preparation sheets

The DLC heads and Balsaki's needed to fill in a sheet to prepare for each activity. These sheets could be filled based on the information given in the activity cards. Each phase of the lesson was thought about

Reflection sessions

After each class, before each micro teaching session a reflection took place for the DLC heads and Balsaki's to share there experiences with the curriculum material and the activities. These sessions were planned to take about 30 minutes

Daily notes

During the total implementation process DLC heads and Balsaki's were asked to keep a 'diary'. They were asked to reflect in their daily notes on the aspects of the materials that stimulated good implementation and on the aspects that hinder the implementation process. Also they were asked to reflect on their difficulties with the curricular materials.

6. FINDINGS

After the presenting the designs made during the study it is important to understand why and how these designs were made. This chapter presents the findings of the analysis that ground the three designs. Additionally, this chapter provides information on how these findings occurred and from which respondent group the findings derived. Also an example of the design (chapter five) is given during the description of the findings. And the findings on the evaluation of the new material is presented.

As described before the categories that are used to understand the characteristics of the material, the design process and the implementation process are the quality criteria (validity, legitimacy and efficacy). This implies that the quality criteria are not only used to understand the characteristics of the curriculum material, but also to categories findings on the design- and implementation process. To be able to use the criteria for all three areas, the criteria were operationalized (see chapter 4).

The findings of this research (analysis and evaluation) will be presented according to these criteria. The three area of this research will be treated separately. This chapter is divided into three main sections: findings on the characteristics of the curriculum material (A), findings on the characteristics of the design process (B), and findings on the characteristics of the implementation process (C), In these three sections the relevant quality criteria will be treated.

As mentioned in chapter 4, three phases were used during this research, the data is collected during an analysis phase, a design phase and an evaluation phase. The findings will be presented according to this three phases. After describing findings for each quality criteria, a table will be presented to summarize these findings. The tables presented in this chapters will be used accordingly to the explanation given in table 6.1

Table 6.1; Explanation of the presentation of the findings

<i>Criterion</i>	<i>Derived from..</i>	<i>Design (Example)</i>	<i>Evidence</i>
This column will describe what the quality criteria means in the context of Pratham. A concrete criterion for Pratham is presented. This criterion is based on the findings of the analysis.	This column will describe the source or respondent group from which the criterion was found. It represents the analysis phase. (in some cases only literature is used as a source for the criterion)	This column represents the design phase of the research. The design is based on the criteria found in the analysis. An example –related to the criteria- of this design is given	This column represents the evaluation phase of the research. To be able to judge if the design meets the criterion an evaluation was conducted. In this column evidence is presented that proves that the design was meets the criteria
When a row is light grey, this means that the evaluation proves that the design was not able to meet the criteria yet. Improvements need to be made based on these criteria.			

The construction of the sub sections of the findings is generally the same. All sections describe the finding derived from the analysis phase. It starts by mentioning the respondents groups or sources that were used to ground the analysis. A description of the characteristics/shape of the design process can be found in section three of the Appendix. Because of a understanding of the findings on during the evaluation phase, sometimes remarkable aspects of this design phase are mentioned. Also in the column ‘example’ of each table, explicit information can be found on how the design

contributes to criteria. Besides this attention is paid to the evaluation phase of the research. At each quality criteria findings are presented on how the design contributed to the criteria. Also at the evaluation a selection is made while presenting finding. Remarkable finding are presented, for a complete overview is referred to the table at the end of each quality criteria.

A. CURRICULUM MATERIAL

6.1. VIABILITY

The curriculum material in the different trunks should be realistically usable in everyday practice for the DLC-heads as well as for the Balsaki's. The teacher guidance that is included should be as such that it can be used by the un(der) graduated educators, Besides this the lessons given should have little preparation time.

The materials should be relevant to the needs and wishes of the children in slums, their parents and the organization. The materials should be physically robust; the activities embedded in the material will still be possible once initial support fades.

6.1.1. Practicality

The results derived from the research on the practicality of the curriculum material is based on the data from the following respondent groups: NGO-heads, the DLC-heads, the Related people within Pratham, and the Management of Pratham.

The following findings on practicality can be identified. Based on interviews with the DLC-heads during the analysis the materials were not usable in everyday practice because of the level of the materials, the grouping of the children and the capacity of the educators, other ways to improve the practicality is by consideration of the level of the material. Although children are of age 6-13, the practicality improves when offering curriculum materials start with the basics of a subject. Also the NGO-heads mention that the practically improves when the materials get self-explanatory. Additionally, the DLC-heads mention that the materials should be sufficient for many different levels and because of this, the curriculum materials should be multi usable. Both the NGO-heads and the related people mention that curriculum materials should be organized in such a way that the grouping of the children is leading towards a situation where children are able to focus completely on the material. Grouping that seemed to be effective during this research was: grouping according to the level of the children in Science and Maths, and grouping according to gender in Arts. When examining the practicality issues when considering the capacity of the teachers the following findings occurred. Related people indicate that the material and teacher guidance should be prescriptive, the DLC-heads point out that every material should be present in the trunk and that the preparation time for one lesson may not cost more than 5 minutes. Besides this the materials should be designed in such a way that the teachers understand the content and the purpose of the materials, according to the NGO-heads. In one case during this research teachers actually got scared of one trunk because of the content: science. Additionally, the teachers the language of the teacher guidance should be easy and understandable. Other issues on the practicality of the curriculum materials that got clear during the research is that the material should not take up too much space in the DLC, because of the limited space of a slum house and the materials should not be too dangerous to use.

The above described findings were included in the design criteria (see appendix 2) and during the design phase of the research the findings of the analysis were considered. Remarkable aspects of the design are the grouping of the children and the way the teacher guidance is shaped. The teacher guidance contains step –by-step prescriptive guidance on how to conduct the activity. Also do's and don'ts are described to guide the teacher. To help the teacher with the different level in the class. Differentiation

guidance is offered for each activity. 40% of the activities, maybe even more are group activities. Not only do children work together, they also need each other to complete an assignment.

The findings on the evaluation of the practicality of the material are indicating that improvements can be made on four of the criteria on the practicality of the materials. The materials should be more child friendly, the materials should be more self-explanatory, the material should be more clear, and the language should be more understandable. A summation of the findings can be found in table 6.2.

Table 6.2; Summation of the findings on the practicality of the material.

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The material starts with the basics of a subject	Interview with the DLC heads	Materials maths-trunks starts with addition and abstraction one-by-one digit	Curriculum material
The materials is self-explanatory.	FGD with NGO heads	Children can work with the material on their own. Teacher guidance is working step by step telling teachers what to do	Classroom observation show that the materials is self-explanatory
The material is multi usable (for the different levels of the children)	Interview with the DLC heads	Differentiation included in the teacher guidance.	Classroom observation, interview DLC heads
The materials contains group activities (for the different levels of the children)	FGD with NGO heads, interview related people	40% of the activities in the material are group activities	Curriculum material
The materials has prescriptive teacher guidance	Interview with related people	Step by step teacher guidance, do's and don'ts included in guidance	Curriculum material, interview with Balsaki's
The materials has got all the necessities included	Interview with DLC heads	All materials are included in one trunk	Curriculum material
The materials is child friendly	Interview with DLC heads	No sharp objects, dangerous science experiments are not longer included in the trunks	Interview with DLC heads
The materials has a maximum preparation time for one lesson of 5 minutes	Interview with DLC heads	No preparation is needed but to gather the materials and the activity card	FGD NGO heads
The material is that clear that teachers understand the content	FGD NGO heads	Extra reading material is provided in the trunk on the content of the trunk	Classroom observations, interview DLC heads
The material is that clear that teachers understand the purpose	FGD NGO heads	The purpose and goals of the	interview DLC heads, FGD NGO heads
The materials has easy and understandable language	FGD NGO heads, classroom observations	Short sentences, understandable words are designed and thought of	FGD with the NGO heads
The materials does not take up too much space in the DLC	Interview DLC heads	The trunks were all bought, this couldn't be changed	

6.1.2. Relevance

The results derived from the research on the relevance of the curriculum material is based on the data from the following respondent groups: children, NGO heads, the DLC-heads, the Related people within Pratham, the Management of Pratham and the NOS team. From the analysis the following findings on relevance can be identified. The parents indicated that the current materials is very relevant to their needs and wishes. They indicate that the relevance of the material is related to the content of the subjects. They want their children to learn about mathematics and school-related subjects. Based on meetings with the management during the design phase of the research findings on relevant occurred that the materials was not yet relevant to the needs and wishes of the organization. The management pointed out that the materials should be child-centred and project based. The children mentioned during a micro-evaluation that their needs and wishes are that the material is interesting. The relevance of the curriculum materials can be improved by only designing subjects like mathematics, history and science,. Curriculum materials like hygiene and savings are not relevant to their needs. Findings on relevance from the respondents group of the children indicates that it is their wish to work together more often in a group.

The above described findings were included in the design criteria (see appendix 2) and during the design phase of the research the findings of the analysis were considered. The findings on the evaluation of the relevance of the material are indicating that improvements can be made on the child-centeredness. Although the materials are focussing on this, the actual happening in class are not child-centred. A summation of the findings can be found in table 6.3

Table 6.3; Summation of the findings on the relevance of the material.

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The materials treats parts of the exam subjects	Parents, related people and DLC-heads	Material is based on national framework (GNERT)	Curriculum material
The materials is child centred and project- based	Meeting with management	All materials are project-based. Child-centeredness can be carried out while using the materials	Curriculum material, classroom observation
The materials is interesting	Micro evaluation with children	Material contain experiments, games, talk assignments.	Interviews with the children
The materials contains group work	Interview with children	40% of the activities in the material are group activities	Curriculum material

6.1.3. Sustainability

The results derived from the research on the sustainability of the curriculum material is based on the data from the following respondent groups: the DLC-heads, the Related people within Pratham, and the Management of Pratham. Additionally classroom observations and checklist give insight in the sustainability of the materials. These two instruments were used during the analysis of the research, and found that the materials are not sustainable. During the observations one could see that the materials were not physically robust (e.g. teacher guidance and examples for children were printed on normal paper, in temperatures of 45 degrees). The materials couldn't be used for more than three times, before the trunk got empty. According to the management the curriculum materials should last for at least three years. Also the DLC-heads indicated

that there many breakable things were included in the trunks which doesn't lead to sustainable curriculum material. The management and the related people mentioned that sustainability of the curriculum materials also included that children find the materials interesting enough to attend class: "the materials should be very interesting otherwise the children won't come in our schools anymore and the trunk-education will not sustain". Additionally the NGO-heads indicate that the materials should not be too time consuming nor too difficult, otherwise the teachers will not use them anymore, ones the support of the Pratham office has stopped.

The above described findings were included in the design criteria (see appendix 2) and during the design phase of the research the findings of the analysis were considered. The findings on the evaluation of the relevance of the material are indicating that the materials are not sustainable. When looking at the curriculum material one can see that glass test tubes are inside the trunk. When the trunks arrived at their destination all the tubes were broken. Also the materials inside the trunk (e.g. the papers, glue, pencils) will run out. During a discussion with the NGO heads it seemed that some of the science lessons were far too difficult. One NGO heads said that the children in one DLC didn't show up the following day. A summation of the findings can be found in table 6.4

Table 6.4: Summation of the findings on the sustainability of the material.

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The materials is physically robust (doesn't contain breakable things)	Classroom observations	The activity cards are all printed on cardboard, some materials are from glass (e.g. test tubes)	Curriculum material, FGD NGO heads
The materials is usable for more than three years	Classroom observations, meeting with the management	The content of the curriculum is usable for more than three years. The materials will run out and need to be replenished	Curriculum material
The material is that interesting that children will attend class each time	Interview related people, meeting with management	Material contain experiments, games, talk assignments.	Classroom observations, interviews with children
The material is not too time consuming	FGD with the NGO heads	All activities take one to two hours	Curriculum material
The material is not too difficult	FGD with the NGO heads	The levels of the material is adjusted to the level of the children	FGD NGO heads.

6.2. LEGITIMACY

The rational behind the materials is based on relevant literature on the levels, representations, coherence, components, curriculum artefacts and quality criteria of curriculum material. The materials should be internally and externally consistent. There is harmony and their is coherence among the system factors

6.2.1. Contemporary scientific insights

The results derived from the research on the contemporary scientific insights of the curriculum material is based on the data from the document analysis, the checklist. Additionally FGD's and interviews with the NOS team, management team, and related people were held to gather more data. The analysis of the curriculum materials with the help of the checklist on contemporary scientific insights indicated that the materials were not based on contemporary insights. Additional interviews cleared that this was the case because everything designed so far was based on experiences with piloting the materials. After a literature review scientific insights like the levels, representations,

coherence, components, curriculum artifacts and quality criteria of curriculum material were discussed and included in the design criteria.

During the design phase of the materials the included scientific insights were criticized by the management. The findings during the meetings with the management of Pratham are that the characteristics of the materials when it comes to scientific insights needs also be based on Bloom’s Taxonomy and the learning objectives need to be SMART. Besides this the materials need to be framed on the works of the NCERT (National Council of Educational Research and Training) , a national Indian framework on what children should learn at which age.

From the evaluation the following findings on contemporary scientific insights can be described. The NOS team mentions in a FGD, that because of the scientific insights that were included in the design criteria, they were able to made ‘sound’ materials. Additionally they mention that the scientific insights they used for the content of the material (e.g. science, math) improved the materials as well. (“we did not borrow lessons from the internet, but were able to come up with things on our own”). The management points out that based on insights from literature the design team is able to make high qualitative trunks. A summation of the findings can be found in table 6.5.

Table 6.5; Summation of the findings on if the material is based on scientific insights

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The material is based on theories on the levels, representations and components of a curriculum	After analysis, and location of gaps literature review was conducted, criterion is based on this review	Activities are interrelated and balanced. Classroom observations show that all components of the spiderweb function.	Checklist, Curriculum material
The material contains SMART learning objectives	Meeting with the management	All ILO’s are SMART, including ABCD formulation	Checklist, Curriculum material
The material contain learning objectives that are based on Bloom’s taxonomy	Meeting with the management	The material in one trunk have got all competences of Bloom in it. Activities are designed for knowledge, comprehension, application, analysis, synthesis and evaluation.	Checklist, Curriculum material
The material is based on the national framework NCERT	Meeting with the management	Material is based on national framework (GNERT	Checklist, Curriculum material

6.2.2. Consistency, Harmony & Coherence

The results derived from the research on the usage of contemporary scientific insights of the curriculum material is based on the data from the document analysis, the checklist. Additionally FGD’s and interviews with the management team, related people and NOS team were held to gather more data, and to be able to judge the practical aspects from consistency, harmony and coherence. In the analysis phase of the research findings about the consistency, harmony and coherence mainly come from the data from the checklist. When looking at this data one can see that the components of the materials were not consistent with each other. Harmony and coherence was not reached at this time. Interviews with the management of Pratham pointed out that the design team didn’t know anything about the consistency, harmony, nor coherence. Also the related people could say that there was no consistency between the components of the materials. Mainly the assessment and the teacher role were not in balance with the rest of the components. The rationale and the learning objectives were not consistent During

the design phase several meetings on these aspects brought some clearness about these concepts. Also during the prototyping and micro-evaluations the consistency, harmony and coherence played a important role. The representations of the curriculum are not consistent with each other. The attained curriculum is not the implemented because level is too high for the teachers and there is no sufficient guidance. Also the attained curriculum is not what we as a design team wanted to do. Another component which occurs during the design phase is the grouping of the children, that should be consistent with the rest of the curriculum (e.g. what happens to the role of the teachers and the time)

From the evaluation phase the following data can be derived. The management indicated that first all the components of the materials should be clear and designed before creating balance between them. They also mention that there needs to be consistency in the trunks because the current trunk needs quality improvements and improved implementation process The related people point out that the harmony also is depended on the guidelines from the state of Gujarat. Checklist shows that internal consistency is their, also classroom observations and interviews and formative evaluations helped, the different way of assessment, guidance for the teacher, instructions in activity cards on grouping for the different role of the teacher. Interviews with management and related people indicate that the intended curriculum is closer to the attained than ever. A summation of the findings can be found in table 6.6.

Table 6.6; Summation of the findings on the consistency, harmony and coherence of the material

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The material is internally and externally consistent:	Checklist 1	The different components of the material are balanced	Curriculum material
There is consistency between the assessment and the teacher role	Checklist 1	The assessment and the teacher role are in balance	Curriculum material, FGD with NGO heads
There is consistency between grouping and the teacher role	Checklist 1	The grouping and the teacher role are in balance	Curriculum material, FGD with NGO heads
The material has harmony between the representations	Classroom observations, interview	The intended, implemented and attained curriculum are in harmony	Classroom observation in implementation process
The material coherence with system factors	Interviews management	Based on framework of GNCERT, preparing for the exams	Interview with management, curriculum material

6.3. EFFICACY

The materials correspond with the desired results of the teachers, parents, state of Gujarat and the organization. The materials are worth the cost, time and efforts which were made. The materials are efficient; they match all quality criteria.

6.3.1. Yield desired results

The results derived from the research on yield desired results of the curriculum material is based on the data from the following respondent groups: NGO-heads, the DLC-heads, the Related people within Pratham and the parents. From the analysis the following findings on the yield desired results can be identified: According to the management the desired results are that the children learn how to work in a group. They state: “the total educational system is based on individual achievements. This will never build a society

that is willing to help each other.” The parents mention that they want their children to learn school related subjects. This because of the material the children should be able to get back to the regular schools and get high marks there. The Balsaki’s support this point when indicating that the material should attend to parts of the school exam. The managements defines that the materials should be complete and interesting. Additionally the management wants the material to be holistic and project based, also they want the material to be complete in its competences: Bloom’s taxonomy (knowledge, comprehension, application, analysis, synthesis and evaluation competences in one trunk). The DLC-heads want to offer children material that has got a strong connection with real life. The want to have material that let children express themselves and respect each other, activities that uses former experiences of the children as a start point. Besides this, the trunks need to be sellable, is mentioned by the NGO heads.

The above described findings were included in the design criteria (see appendix 2) and during the design phase of the research the findings of the analysis were considered. Remarkable aspects of the design are the grouping of the children, 40% of the activities, maybe even more are group activities. Not only do children work together, they also need each other to complete an assignment. Also to include the former experiences of the students is a remarkable change in the design. The introduction of each lesson starts with a talk about the former experiences and to understand the level of the children.

The findings on the evaluation of the practicality of the material are indicating that the That improvements can be made on the completeness of the material. The materials are based on the NCERT framework, but still, what is complete. You cannot offer everything about a subject in one trunk. After several meetings with the management Bloom’s taxonomy is used to aim to a more complete trunk. A formative evaluation points out that an improvement can be made by making a stronger connection with real life, than the current material. A summation of the findings can be found in table 6.7.

Table 6.7; Summation of the findings on the yield desired results of the material

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The material contains group work	Meeting with the management	40% of the activities in the material are group activities	Curriculum material
The material contains school related subjects	Parents and Balsaki’s	Choice is made for math, science and art trunk instead of savings, hygiene and transport trunks	Curriculum material
The material is complete	Meeting with the management	According to the GNCERT framework	Curriculum material
The material is interesting	Meeting with the management	Material contain experiments, games, talk assignments.	Interviews with the children
The material is holistic and projects based	Meeting with the management	All materials are project based.	
The material is based on Bloom’s taxonomy	Meeting with the management	The material in one trunk have got all competences of Bloom in it. Activities are designed for knowledge, comprehension, application, analysis, synthesis and evaluation.	Curriculum material
The materials has a strong connection with real life	Interview DLC heads	All introductions of all activities start with looking back, and sharing real life experiences on the subject.	Formative evaluations
The material lets children express themselves and respect each other	Interview with DLC heads	e.g. the material in the art-trunk, ask of children to express themselves in word, feelings and creative actions.	FGD with NGO heads
The materials uses former experiences as a starting point	FGD with the NGO head	All introductions of all activities start with looking back, and sharing real life experiences on the subject.	Curriculum material

6.3.2. Cost benefit ratio

When asking the management if they were able to judge the efficacy when considering the cost benefit ratio, they pointed out that it is for them too early to say something about the costs of the materials. The only thing finding from this interview is that the trunk may not cost more than 2500-3000 Indian Rupees (approximately 50 Euros).

6.4. CONCLUSIONS

When analyzing the situation of Pratham to make improvements on the viability of the curriculum materials for the use by un(der) qualified educators in the slums of India practicality of the material can be created by grouping of the children to level or gender. By making materials that can be used by children of different levels, that have a time period of less than 1.5 hour and a maximum of 30 days. Practicality can also be created by designing teacher guidance that is prescriptive and has easy and understandable language. The teacher should understand the purpose and the goals of the materials. Also all necessities need to be included in the trunk and should be child friendly. The relevance of the material is that the content treats parts of the exams subjects. Also the material should be child-centred materials and project based materials. The sustainability of the materials can be reached by creating materials that are physically robust and usable for more than three years.

Legitimacy of the curriculum materials can be created by designing the curriculum materials with a rationale that is based on the theories on the levels, representations and components of a curriculum. Also legitimacy of the materials can be created by designing learning objectives that are SMART, based on Bloom's taxonomy and on the framework of NCERT. Consistency of the materials can be reached by working mainly on the consistency between the components of assessment and grouping in combination with the teacher role. Harmony can be created by following an iterative design approach. Efficacy of the curriculum materials can be created by creating materials that contain group work, helps children to get back into school, to create materials that are complete, interesting and holistic. Additionally efficacy is created by designing materials that have a strong connection with real life, also the materials should use the former experience as a starting point.

These findings are used as input for the design. Design criteria were formulated in order to make sound, complete material. Some remarkable aspects from the design phase are: 40% of the activities in the material are group activities, the teacher guidance is steps-wise prescriptive, contains 'do's and don'ts' and differentiation guidance on each activity card.

After designing materials on basis of these inputs an evaluation was conducted in order to understand if the new materials met the above mentioned criteria. From the findings of this evaluation one can conclude that the improved materials meets most of the criteria from the analysis. Improvements can be made on the following aspects: on the viability of characteristics, the material need to be more child friendly, child centred and project based. The materials should be physically robust and usable for more than three years. Additionally the teacher guidance should be improved in such a way that the educators are able to understand even more of the content of the materials. When considering legitimacy the materials can be improved by creating harmony between the different representations of the curriculum and to make complete trunks. Efficacy improvements can be made by creating materials that have a stronger connection with real life.

B. THE DESIGN PROCESS

6.5. VIABILITY

The design process is realistically usable in the context of the organisation and leading toward practical products. The design process is relevant to the needs and wishes of the design team and the organization. The design process will still be possible within Pratham, once external support and encouragement are withdrawn

6.5.1. Practicality

The results derived from the research on the practicality of the design process is based on the data from the following respondent groups: NOS-team and the management of Pratham. Additionally findings on the practicality of this process can be found in the logbooks and during observations.

When considering if the process is usable in the context of the organization, the following finding during the analysis can be described. Data in the logbooks on the different meetings point out that the organization is so much willing to learn that almost every change in the design process will be realistically usable. Still there are some boundary conditions that determine if the process will be usable by Pratham. Data in the logbook indicates that the decisions in the end are taken by Aditya, the boss. Another boundary condition is that there are 10 people in the design team that all need to work on the design of the materials and the organization decided to redesign the 3 trunks in a time period of 2 months. The design process must be shaped accordingly to these characteristics. Also FGD with the management point out that the current design process is not leading toward practical products. Besides this the products are taking up too much time to design. There is not one direction in how the materials should be shaped. The process is happening in a informal manner. Observations, FGD and meetings point out that there is no consistency of method of design, everyone works in a different way, and is documenting to his own beliefs, the current process doesn't have a goals or aim, but the materials are already bought, based on what? Besides this the reviews are unstructured, this will lead to major shifts in design approaches. Each meeting a new most important and very urgent point is discovered or created.

Remarkable aspects of the design of the process are the usage of design criteria. These rigor the process, made it systematic and structured the reviews. Another aspects is the same way of designing of each member of the NOS team. Also the presentation and the documentation of the prototypes are characteristics of the design.

Findings during the evaluation of the process are that there seems to be a more systematic way of curriculum design according to the management. Also this way of systematic design leads to practical products: "They now know how to make a realistic design with quality". The NOS team is making use of a planning, they are able to work systematically what results in complete trunks that are done in time accordingly to Gargi, a member of the management of Pratham. Monal another member of the management says that because of the structuredness in the design process, the teachers can easily work with the materials. The NOS team points to the advantage of the systematic design process when describing that they were able to locate gaps and improve them. A summation of the findings can be found in table 6.8.

Table 6.8; Summation of the findings on the practicality of the design process

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The process respects the given hierarchy	Logbook	Decisions are in the end taken by Aditya.	Annual plans are being made (and executed), based on process
The process is accurate for 10 people	Meeting with management	Ten people design three trunks	FGD with NOSteam
The process produces 3 trunks	Meeting with management	A Science, Mathematics and Art trunk are redesigned	The trunks
The process leads to practical products	Meeting with management	The process leads to trunks that are shaped accordingly to the quality criteria.	Classroom observations and interviews with DLC heads proof that the process leads to practical materials
The process doesn't take up too much time to design.	Meeting with management	3 trunks are designed within the deadlines. It takes 3 to 4 weeks	Logbook
The process has only one direction	Meeting with management, observations, FGD with NOS team	The design of the material is shaped by the agreements based on the design criteria. After the criteria are solid, only one direction in design is taken	Design criteria
The process has a systematic manner	Meeting with management,	Iterative, using a planning analysis, design, evaluation. Formative evaluation, prototyping, reviews, meetings with action points	Interviews with the management and FGD with the team
The process is shaped in such a way that everyone works and is documenting in the same way	Meeting with management	Everyone makes a logbook of the design. All the prototypes are presented in the same manner. There is one logbook for each trunk. Minutes are made of all meetings	Logbook, FGD with the team
The process has a goal/aim	Meeting with management	The goal is to meet the design criteria	Design criteria
The process includes structured reviews	Meeting with management	3 reviews are included in 3 weeks. Reviews are based on the design criteria. The reviews are prepared and evaluated. People who participate get a focus point from the team. Minutes are made. Feedback is given to the participants.	Logbook, minutes

6.5.2. *Relevance*

The results derived from the research on the relevance of the design process is based on the data from the following respondent groups: the Management of Pratham and the NOS team. Additionally logbooks and observations provide information on the relevance of the design process. Data from interviews with the management indicate that the needs and wishes of this respondents group is that the process should be more systematic. They want to have a process that includes the input from the Balsaki's. Additionally there wish is that by help of the design process the design team will learn more about curriculum design. This is as they say, one of the main reasons to let them go into the field twice a week. Interviews and FGD's with the NOS team during the analysis phase point out that the design process should be faster, foster more learning and lead to suitable trunks. Meetings with the NOS team point out that the design process should contain more freedom, also a better presentation of the materials should be included in the design process.

The above described findings of the analysis were used to shape the design process. A remarkable aspect of the design phase of the research is the freedom of the design team that is provided by restrictions. Agreements are made in the form of design criteria. This creates clearness about the things that should happen and because of this created clearness, the team felt freedom to design in the way they wanted.

Findings during the evaluation of the process indicate that the NOS-team is highly motivated to design accordingly to this method. In different meetings and during interviews they say that they feel this way because their wishes and needs are included in the process. They have more freedom to design and have clarity about what the management wants and will judge. The minutes on the formative evaluation in the logbook point out that the Balsaki's opinion is included while designing the materials. Also the growth of the NOS team is evidenced by interviews with the management of Pratham. This interviews indicate that the NOS team learned to design in a systematic manner. A summation of the findings can be found in table 6.9

Table 6.9; Summation of the findings on the relevance of the design process

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The process is systematic	Meeting with the management	Iterative, using a planning analysis, design, evaluation. Formative evaluation, prototyping, reviews, meetings with action points	Interviews with the management and FGD with the team
The process includes the input from the Balsaki's	Meeting with the management	During the reviews/formative evaluations also Balsaki's are invited to give their input on the material	Minutes on formative evaluations
The process helps the design team learn more about curriculum design	Meeting with the management	During the process loads of time is reserved for training moments and meetings on how to design.	FGD with the team, interview with the management
The process is faster than the old process	FGD NOS team	It takes 3 to 4 weeks	Logbook
The process contains more freedom for the designers	Meeting NOS team	After the agreement is made for the design criteria, the designers are free to design in their own way	FGD with the team. Observations during review
The process leads to suitable trunks	FGD NOS team	The process uses the target audience a lot during the design process. Formative evaluations are used to measure if the material is suitable.	Classroom observations and interviews with the DLC heads

6.5.3. Sustainability

The results derived from the research on the relevance of the design process is based on the data from the following respondent groups: NOS- team and the Management of Pratham. To examine if the design process will still be possible within Pratham, once external support and encouragement are withdrawn, this research focus on the findings on the growth of the NOS-team.

Data from interviews with management point out that they have confidence in the sustainability of this design process. They are actually building annual plans based on this process. For the coming year the NOS-team and the management agreed to design a number of trunks based on this process. Also the management point out that they are more stable now: "we can do it on our own". Also the design process was focussing on the growth and education of the design team, this has happened. Also during the evaluation of the process members of the NOS team indicate that the NOS-team is highly motivated to design accordingly to this method. In different meetings and during interviews they say that this is because their wishes and needs are included in the

process, they also see the relevance of choices made that will help to sustain the process: “At first I thought that it wouldn’t be helpful at all, but now we realize that the curriculum material actually got better”. A summation of the findings can be found in table 6.10.

Table 6.10; Summation of the findings on the sustainability of the design process

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The process is still possible within Pratham when external support is withdrawn	Literature	This is taken care of by the learning that occurs during this design process. The team will learn during the process and will be able to use it when the external support is withdrawn	Interview with the management, annual plans
The process is still possible within Pratham when external encouragement is withdrawn	Literature	The process also focus on the motivation of the NOS team. The process is design according to their wishes	FGD with the NOS team

6.6. LEGITIMACY

The rationale behind the design process is based on the theories of systematic curriculum design, the design paradigms, prototyping and formative evaluation of the curriculum material. The design process should be internally consistent and draw attention to external consistency.

6.6.1. Contemporary scientific insights

The results derived from the research on research on the contemporary scientific insights of the design process is based on the data from the following respondent groups: the NOS-team and the Management of Pratham. The analysis of the design process on contemporary scientific insights indicated that the current design process was not based on these insights. An additional interview with the management of Pratham cleared that no one in the design team, and almost nobody in the management of Pratham knew anything about curriculum design. Also observations point out that the main focus of the management is that on personal growth, not on the usage of new theories on the design of curriculum materials. During the design phase of the research different theories on systematic curriculum design, the usage of prototypes, and the usage of formative evaluation was offered to the design team as well as to the management team. The evaluation phase of the research conducts the following findings on contemporary scientific insights: In the design process theory is used to shape the design concludes the management during an interview. Also they mention the team worked accordingly to the literature on how to design a curriculum. The NOS-team says that the scientific insights guided their design process and also made the topics they design more ‘deft’, and with that it made the trunk more interesting. A summation of the findings can be found in table 6.11.

Table 6.11; Summation of the findings on if the design process is based on scientific insights

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The process is based on theory on systematic curriculum design	After analysis, and location of gaps literature review was conducted, criterion is based on this review	Process is designed with iterative approach, with formative evaluation moments, making use of the prototyping approach	Logbook shows systematic approach
The process is based on theory on prototyping	After analysis, and location of gaps literature review was conducted, criterion is based on this review	Prototyping is used in the process	Logbook shows prototypes made
The process is based on theory on formative evaluation of curriculum material.	After analysis, and location of gaps literature review was conducted, criterion is based on this review	Formative evaluation is used in the process	Minutes of formative evaluations and FGD afterwards

6.6.2. Consistency, Harmony & Coherence

The results derived from the research on consistency, harmony and coherence is based on the data from the following respondent groups: the NOS-team and the management team of Pratham. Besides these resources also information can be collected from the following instruments, the logbook and observation schemes. During the analysis the following findings occur, there is no internal consistency between the components of the design process. The Based on information gathered during interviews with the management of Pratham the design process precedes informally following no set, systematic procedure. Because of this internal inconsistency also the external consistency is at stake. The management says that because of this way of designing consistency cannot be reached. One person in the management team even mentions that there was no need and no goal for the trunks the organization was designing before this research started. The only thing how the process is being shaped when it comes to consistency between the components is by judging and evaluating the planned and actual actions in daily practice. Based on observations in the logbook, nobody in the NOS team is including the same components in the curriculum material. (e.g. one trunk doesn't have assessment, because of the beliefs of the designer)

During the evaluation the team has started to be responsible for more than one task at the time, according to the NOS-team. Also the management says in an interview that the team was forced due to the design process to think about the total design, while designing only one component. Another observation made by the management is that the team was able to design consistent trunks. The observations done by the researcher on the other hand point out that although the team is thinking about the total design, improvements can be made in designing consistency. A summation of the findings can be found in table 6.12.

Table 6.12; Summation of the findings on consistency of the design process

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The process creates consistency between the components of the design process	Literature, meeting with the management	The different components of the design process, like analysis, design and evaluation are in balance	Interview with the management
The process is a systematic procedure	Interview with the management	Process is designed with iterative approach, with formative evaluation moments, making use of the prototyping approach	Logbook shows systematic approach
The process is shaped in such a way that everyone includes the same components in the material	Meeting with management	Everyone makes a logbook of the design. All the prototypes are presented in the same manner. There is one logbook for each trunk. Minutes are made of all meetings	Logbook, FGD with the team
The process invites designers to think about the total design, while designing only one component..	Logbook	From the start of the process the designers have a vision of the end result,. In the design criteria the different components are included.	Interview with management

6.7. EFFICACY

The design process correspond with the desired results of the team as well as the organization

The design process is worth the cost, time and efforts that are made. The process is efficient; materials can be designed that match all quality criteria

6.7.1. Yield desired results

The results derived from the research on the yield desired results of the design process is based on the data from the following respondent groups: the NOS-team and the management of Pratham. Data from the interviews with the management during the analysis phase of the research indicated that the management want the design process to have a bottom up approach: “It is the team who is giving direction to the design choices, because they see the practice during the design”. The NOS-team say in a FGD that the desired results of the process is that the process should create more trunks and make the design more effective. Also they want to have a process that includes the opinion of children, so that the materials will be more exiting and for the right level.

During the design phase of the research findings from the logbook say that the NOS-team has another repeating desired result for the process. They wanted to learn as much as possible about how to make ‘sound’ trunks.

Data gathered during the evaluation of the yield desired results of the design process point out that the NOS-team really have confidence in their own capability to design trunks. They mention during a FGD that they understand how to systematically design a trunk. Also they mention that because of the design criteria they are able to design more trunks, because they now know what the goal is. “It goes faster”, they say. Also the findings on the opinion of the management on the yield desired results seem to be positive, Monal is saying that the team has more freedom and more restrictions at the same time. A summation of the findings can be found in table 6.13.

Table 6.13; Summation of the findings on the yield desired results of the design process

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The process has a bottom up approach	Interview management	The designers can make decisions during the process, but the hierarchy is respected while redesigning the process	Interview management, process has been taken up in the annual plans
The process creates more trunks than the current process (5 trunks in 3 years)	FGD NOS team	Time period of one trunk increase, 3 to 4 weeks	Logbook, minutes, planning's
The process includes the opinion of children	FGD NOS team	During formative evaluations (micro-evaluations) children were invited to give their opinion on the material (e.g. excitement)	Logbook, minutes on micro-evaluations
The process fosters learning of the design team.	Interview management	During the process loads of time is reserved for training moments and meetings on how to design.	FGD with the team, interview with the management

6.7.2. Cost benefit ratio

When asking the management if they were able to judge the efficacy when considering the cost benefit ratio of the design process, they pointed out that it is for them too early to say something about the costs of the design process. But they were willing to give a 'soft' version: In their opinion the confidence of the design team has grown during the last three months, a growth that in their opinion lead to a better work environment and a faster production of the materials. So in the opinion of the management "the benefits are bigger now we are able to produce faster, this may lead to cheaper trunks in the end."

6.8. CONCLUSIONS

When analyzing the situation of Pratham to make improvements on the viability of design process in order to make good quality materials, a process needs to be created that respects the given hierarchy, that leads to practical materials and doesn't take up too much time. Also from the analysis the need for only one direction during the process was found, this one direction must be created in the way of working as well as in the way of documenting. The process has to have a goal/aim and include structured reviews, a systematic design process is desirable. It should make the materials faster than the old process and the NOS team needs to have freedom during the design process.

Aspects considering the legitimacy of the design process that occurred during the analysis phase of this research are that the process needs to be based on and formative evaluation of curriculum material. Additionally, consistency needs to be created between the components of the design process. The process should also invite the NOS team to think about the total design, while designing only one component. Efficacy of the process in Pratham's situation means that the design process has a bottom up approach. Also considering the efficacy a remark is made about the efficiency of the process, the speed of the process needs to increase. The old process produced 5 trunks in 3 years. Additionally the opinion of the children must be included.

These findings have been used as input for the design. Some remarkable aspects from the design phase are: The usage of design criteria, based on these criteria the formative evaluations were structured. Also a planning was made in order to meet the criteria derived from the analysis. Additionally input from the Balsaki's and the children are remarkable aspects of the design phase during this research. The speed of the process

increased, 3 trunks were designed in 1.5 month. Another noteworthy aspect is the created freedom for the NOS team by restricting them by letting them agree upon the design criteria.

The improved design process meets most criteria derived from the analysis. Findings during the evaluation phase indicate that improvements can be made on the following aspects: The process must be shaped in such a way that everyone includes the same components in the material, although everyone included the same components in the end of the process. Guidance was very much necessary on this aspect. Also improvements can be made on the sustainability of the ideas concerning the design consistency. The team found it difficult to think about the total design, while designing. Another improvement found during the evaluation phase is that a more bottom up approach must be created. This approach not completely compatible with the hierarchy within the organization

C. THE IMPLEMENTATION PROCESS

The design of the implementation process is not performed by the researcher. This is due to the fact that this process is too much interweaving with the promotion track of drs. Harini Raval who is conducting a research on professional development of the DLC-heads. Because of the already mentioned strong link between the areas of implementation and the design of the materials, the researcher had the role of discussion partner in the decision-making about the design of the implementation process.

6.9. VIABILITY

The implementation process is realistically usable for both the teachers, their trainers and the organization

The implementation process is relevant to the needs and wishes of the teachers, their trainers and the organization

The implementation process during pilot activities can be scaled to suit the broader target audience

6.9.1. Practicality

The results derived from the research on the practicality of the curriculum material is based on the data from the following respondent groups: NGO-heads, the DLC-heads, the Related people within Pratham, and the Management of Pratham. From the analysis on the implementation process based on interviews with the NGO-heads the following findings occur. In the process there is not enough attention paid to characteristics of the material. They also mention that the DLC-heads don't learn enough about the content of the material. The DLC heads confirm this: "We don't get much of the materials". Also is said that there is not enough guidance for the materials. Additionally data from a meeting with the management indicated that the manuals for the implementation process are not clear. Remarkable aspects of the implementation process during the design phase of the research is the usage of micro-teaching sessions. In these session the teachers attend in a class that is prepared and given by one of the teachers. The exact activity is absorbed in these sessions. The extra reading material are treated during this sessions and the teachers better understand the content.

Feedback moments with the NGO-heads during the implementation process of the material point out that the process takes up too much time, also the feedback session with the DLC-heads about everything that happened in class takes up too much time. DLC heads indicate that the preparation and implementation process takes up more time than the actual activity of the curriculum material. Also the management acknowledges that the preparation takes up too much time. Management: It is all about classroom management. We need to prioritize the different problems, because the DLC heads don't act upon the real problems. Observations show that the materials are used in a different way, than they are intended. A summation of the findings can be found in table 6.14.

Table 6.14; Summation of the findings on the practicality of the implementation process

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The process pays attention to characteristics of the material	Feedback session DLC heads	Micro teaching is part of the process. In this all materials in the trunks are guided by the process	FGD with NGO-heads
The process is a guidance for the curriculum materials	Feedback session NGO heads	Micro teaching is part of the process. In this all materials in the trunks are guided by the process	Interview with the DLC heads
The process makes use of clear manuals	Feedback session DLC heads & NGO heads	Manuals that are created are preparation sheets, reflection sheets and the activity cards	DLC heads, meeting with the management
The process provokes learning the content of the material	Feedback session NGO heads	Micro-teaching. The teachers are being taught what the next day they are going to teach	Meeting with management, FGD NGO heads
The process doesn't ask too much preparation time from the DLC heads	Feedback session DLC heads, meeting management	The preparation time of material during the process is taking too much time (1.5 to 2 hours a day)	Meeting with management
The process prioritizes the problems	Meeting management	Before the process starts the problems are prioritized	Meeting with management
The process stimulates that materials are used in the way they are intended.	Meeting management	Micro teaching	Meeting with management

6.9.2. Relevance

The results derived from the research on the practicality of the curriculum material is based on the data from the following respondent groups: the DLC-heads and the Management of Pratham. The DLC heads indicate that the current process is not relevant to their needs and wishes, they want more guidance on how to address the problems with classroom management. The point out that the children don't like to be grouped with children they don't know, and walk away, they indicate that because of the child centeredness relevance to the DLC heads when it comes to the process of implementation is much more focussing on how the material influence classroom management. The management on the other hand thinks its is relevant to improve the skills of the DLC-heads during the implementation process, they mention in a meeting. Additionally, these meetings with the management pointed out that the needs according to the management was to give the teachers another 'mind set' to get a bigger picture of the content of the curriculum material. Also they indicate that the teacher need to learn more about the content of the different courses. A summation of the findings can be found in table 6.15.

Table 6.15; Summation of the findings on the relevance of the implementation process

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The process pays attention to classroom management	DLC heads	After meeting about prioritization of the problems, the problem seemed to have disappeared.	
The process improves the skills of the DLC-heads	Meeting with the management	Micro teaching session improve the teacher skills	Meeting with the management
The process gives the DLC-heads another mindset	Meeting with the management	?	Meeting with the management
The process provokes learning of the teacher on the content of the curriculum material.	Meeting with the management	Micro teaching session	Meeting with the management

6.9.3. Sustainability

The results derived from the research on the practicality of the curriculum material is based on the data from the following respondent groups: the NGO heads, DLC-heads and the Management of Pratham. Data from interviews with the management of Pratham point out that they haven't got much confidence in scaling up the implementation process. Loads of aspects are working out great. The micro-teaching is working very well, is indicated by interviews with the NGO heads and micro-teaching observations, but the telling about experiences takes too much time. Also the teachers aren't satisfied about the preparation they have to do in order to implement the materials, and during the evaluation of the process the DLC-heads say that they have too little time to implement all material in this manner. Observations done by the management during one of the sessions one getting to know the content of the trunk point out that there is much resistance by the DLC heads to learn themselves about the content of the trunk. A summation of the findings can be found in table 6.16.

Table 6.16; Summation of the findings on the sustainability of the implementation process

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
The process can be scaled up to suit the broader target audience	Literature	The process is as such that it can be used during other programs and other offices of Pratham	Interview with management

6.10. LEGITIMACY

The rationale behind the implementation process is based on the theory on factors and strategies of implementation of curriculum material. The implementation process should be internally consistent and draw attention to external consistency.

6.10.1. Contemporary scientific insights

The results derived from the research on the practicality of the curriculum material is based on the data from the following respondent groups: the DLC-heads and the Management of Pratham. The analysis of the implementation process with the help of interviews and meetings with the management of Pratham indicated that the design process is not based on contemporary scientific insights. The materials were piloted in the classrooms together with the teachers, that resulted in information to ground the implementation process on. After a literature review (mainly done by Harini) scientific insights like the factors of implementation and different strategies were discussed in meetings and taken up in the implementation process of the curriculum material.

From the evaluation the following finding on contemporary scientific insights can be described: The management of Pratham tells in an interview that because of the strategies used the process is this effective.

Table 6.17; Summation of the findings on if the process is based on scientific insights

<i>Criterion:</i>	<i>Derived from</i>	<i>Design (example)</i>	<i>Evidence</i>
Should consider the factors of implementation	After analysis, and location of gaps literature review was conducted, criterion is based on this review	It uses the teacher and the NGO heads as starting point for the implementation	The implementation process
Should consider the different strategies of implementation	After analysis, and location of gaps literature review was conducted, criterion is based on this review	Micro teaching sessions	The implementation process
Should consider the usage of exemplary lesson material	After analysis, and location of gaps literature review was conducted, criterion is based on this review	Micro teaching session	The implementation process

6.11. EFFICACY

The implementation process corresponds with the desired results of the teachers, trainers and the organization

The implementation process is worth the cost, time and efforts that are made. The process is efficient; the materials are implemented in such a way that their characteristic match all the quality criteria

6.11.1. Yield desired results

The results derived from the research on the practicality of the curriculum material is based on the data from the following respondent groups: the DLC-heads and the Management of Pratham. Both of the respondent groups have the same desired result, they want the process to contribute to the daily practice and the smooth implementation of the curriculum materials. Also with the desired results the opinions of the two respondent groups differ. The DLC-heads want to have better classroom management after the process, while the management want the results to be that the DLC heads learn more about teaching and about the content of the curriculum material.

6.11.2. Cost benefit ratio

When interviewing the management on the cost, time and efforts were worth the implementation process, there was no answer. Also for this process the management thinks it too early to make a judgement about this. The management could say that the process is not optimal yet. Loads of time is being spent in getting all the different parties 'on the same plane'. This could change, but still, it too early to make a judgement.

6.12. CONCLUSIONS

When analyzing the situation of Pratham to make improvements on the viability of design process in order to make good quality materials, a process needs to be created that serves as a strong guidance for the curriculum materials. Also clear manuals need to be used during the implementation process. Another major aspect of viability is that the educators need to learn content and skill during the implementation process. Additionally the process need to stimulate that the materials are used in the way there are intended. When considering the legitimacy of the implementation process the implementation process should consider the factors of implementation that are important for this context. These are the community, the principal and the teacher. The strategies of implementation need to be considered and the process should use exemplary lesson material.

The design of the implementation process is not performed by the researcher, but by Harini Raval. The findings of the analysis phase are used as input for the design. Some remarkable aspects from the design phase are: The usage of micro-teaching session and the prioritization session. Micro- teaching sessions were used to implement the material. The educators were at the same time preparing for their lessons as well as learning teaching skills and content specific issues about the material.

Findings during the evaluation phase indicate that improvements need to be made in the implementation process. Improvements can be made on the following aspects: The manuals used for the process need to be more clear and understandable language must be used. The preparation time of the implementation and with that usage of the materials takes needs to be reduced. And the process must pay attention to classroom management, when the educators indicate that this is a problem in their daily practice.

7. DISCUSSION

7.1. SUMMARY OF THE RESULTS

7.1.1. *Characteristics of the material*

The characteristics of the curriculum material of Pratham should be as such that the created materials can be used by children of different levels. The time period should be less than 1.5 hour and a maximum of 30 days. Practicality can also be created by designing teacher guidance that is prescriptive and has easy and understandable language. The teacher should understand the purpose and the goals of the materials. Also all necessities need to be included in the trunk and should be child-friendly. The relevance of the material is that the content treats parts of the exams subjects. Also the material should be child-centred materials and project based materials. The sustainability of the materials can be reached by creating materials that are physically robust and usable for more than three years. Legitimacy of the curriculum materials can be created by designing the curriculum materials with a rationale that is based on the theories on the levels, representations and components of a curriculum. Also legitimacy of the materials can be created by designing learning objectives that are SMART, based on Bloom's taxonomy and on the framework of NCERT. Consistency of the materials can be reached by working mainly on the consistency between the components of assessment and grouping in combination with the teacher role. An iterative approach should be followed in order to create harmony. Efficacy of the curriculum materials can be created by creating materials that contain group work, helps children to get back into school, to create materials that are complete, interesting and holistic. Additionally efficacy is created by designing materials that have a strong connection with real life, also the materials should use the former experience as a starting point. After designing materials on basis of these inputs an evaluation was conducted in order to understand if the new materials met the above mentioned criteria. From the findings of this evaluation one can conclude that the improved materials meets most of the criteria from the analysis. Improvements can be made on the following aspects: on the viability of characteristics, the material need to be more child friendly, child centred and project based. The materials should be physically robust and usable for more than three years. Additionally the teacher guidance should be improved in such a way that the educators are able to understand even more of the content of the materials. When considering legitimacy the materials can be improved by creating harmony between the different representations of the curriculum and to make complete trunks. Efficacy improvements can be made by creating materials that have a stronger connection with real life.

7.1.2. *The shape of the design process*

A design process needs to be created that respects the given hierarchy, that leads to practical materials and doesn't take up too much time. Also from the analysis the need for only one direction during the process was found, this one direction must be created in the way of working as well as in the way of documenting. A goal needs to be formulated and agreed upon, by the management as well as by the team before the process starts. The process should include structured reviews, which involve the opinion of the NGO-heads, DLC-heads, Balsaki's and children. Also the findings indicate that

the process should make the materials faster than the old process and the NOSTeam needs to have freedom during the design process.

Consistency needs to be created between the components of the design process. The process should also invite the NOS team to think about the total design, while designing only one component. Efficacy of the process in Pratham's situation means that the design process has a bottom up approach. Also considering the efficacy a remark is made about the efficiency of the process, the speed of the process need to increase. The old process produced 5 trunks in 3 years. Additionally the opinion of the children must be included

The improved design process meets most criteria derived from the analysis. Findings during the evaluation phase indicate that improvements can be made on the following aspects: The process must be shaped in such a way that everyone includes the same components in the material, although everyone included the same components in the end of the process. Guidance was very much necessary on this aspect. Also improvements can be made on the sustainability of the ideas concerning the design consistency. The team found it difficult to think about the total design, while designing. Another improvement found during the evaluation phase is that a more bottom up approach must be created. This approach not completely compatible with the hierarchy within the organization

7.1.3. The shape of the implementation process

An implementation process needs to be created that serves as a strong guidance for the curriculum materials. Also clear manuals need to be used during the implementation process. Another major aspect of viability is that the educators need to learn content and skill during the implementation process. Additionally the process need to stimulate that the materials are used in the way there are intended. When considering the legitimacy of the implementation process the implementation process should consider the factors of implementation that are important for this context. These are the community, the principal and the teacher. The strategies of implementation need to be considered and the process should use exemplary lesson material.

Findings during the evaluation phase indicate that improvements need to be made in the implementation process. Improvements can be made on the following aspects: The manuals used for the process need to be more clear and understandable language must be used. The preparation time of the implementation and with that usage of the materials takes needs to be reduced. And the process must pay attention to classroom management, when the educators indicate that this is a problem in their daily practice

7.2. REFLECTIONS ON THE FINDINGS

While reflecting on the literature the literature that grounds the designs and determines the categorization of the findings the following aspects are noteworthy: Difficulties in creating sustainable material, the student role in the spiderweb, the differences in opinion of the management and the DLC heads while considering the relevance of the implementation, the success of micro teaching, formative evaluation and the completeness of trunks.

The first reflection is on the difficulties to create sustainable materials. To begin with the conception of sustainability is hard to explain to people who don't have a notion about sustainability. Then, when the rationale about sustainable materials was supported, it was still very hard to actual make sustainable materials. The materials do run out, but you still want to provide the children and teachers with paper, and pencils

when they don't have any of themselves. Difficult aspect, when considering this kind of curriculum materials in this context.

The second reflection is on the vulnerable curriculum spiderweb (van den Akker, 2003) (see chapter 3.1, curriculum materials). The model describes that the curriculum has got ten components. While reflecting on this theory the wish to add one component to this model occurred. This is the component of the student role. Because of the characteristics of the slum children, this component is particular important to include during the design of curriculum materials for slum education. This opinion is based on the literature of Khullar & Menon (1996) who in their study describe that slum children have loads of experiences before attending education. They are working and with this work they gain competences. These competences need to be taken into account while designing a curriculum. The role of the student is important to consider.

Another reflection point during the research was when there was a disagreement on the relevance of the implementation process, between the management of Pratham and the teachers. The teachers found the changes in classroom management because of the characteristics of the materials most relevant to consider, while the management didn't think of this as an implementation aspect. The management, on the other hand found the intended, implemented and attained curriculum the most relevant. After a prioritization session the opinion of the teachers had changed, but still the problem occurred in this area.

A very positive experience were the micro teaching sessions. Like Schwartz (2007) mentions in her 'rehearsal curriculum', this strategy that seems to be working well with educators with minimum schooling. Also the formative evaluations and the different methods described by George & Cowan (1999) were successful. Although different methods were used than the described in the theory. A combination was made in the students' reactions that occurred during the learning experience and the success of learners in achieving the intended learning outcomes by observations.

The last reflection point can be found in the yield desired results of the management in making complete trunks. During the research the NOS team and the management worked hard to make complete trunks. But complete in what?! Still during the reflection on this strive to completeness, the wish of the management feels irrelevant. Of course complete curriculum material needs to be designed, but completeness needs to be concretised before being able to work with it.

7.3. STRENGTHS AND WEAKNESSES OF THE RESEARCH APPROACH

The chosen research approach has its limitations and its successes. These strengths and weaknesses influence the findings and are therefore important to describe.

Being a participant of the design team during the research is a strength of the research approach. This because the opportunity was created to be very close to the action. The decisions that were made were transparent. Also the reactions to the proposed design changes were immediately visible, which brought quick findings. The findings therefore were meaningful to their context. Being a participant also has its weaknesses. Because of the submersion in the context, the organisation and the management and the team the risk of subjective findings is significantly higher than when doing research as an observer. A solution was sought in keeping in mind the validity and reliability aspects of the research. Additionally the findings were triangulated and reported to the respondents.

To answer the research questions and to interpret the findings, the restrictions of the research need to be taken into account. The first weaknesses described are the cultural differences and the Gujarati language. Because of the cultural differences the findings of the research can be softened, or too positive. This because of the Indian culture, the people were afraid to be seen as rude or found it difficult to say that something wasn't right because they found it impolite, a positive aspect of the cultural differences is the willingness to work and with a foreign person, and the 'forgiveness' of the management of Pratham. Solutions were sought to this weakness in being in the field so often that my presence became more common, this resulted in more realistic findings.

Because of the choices made during the operationalization of the quality criteria for each of the three areas (see table 6), the difference between two of the criteria became a bit vague. The difference between the 'relevance' and the 'yield desired results' are clear, but during the interviews and overall collection of the data the difference between these two criteria is not that big. The answers of the respondents are similar, apart from the fact that the 'relevance' is a bit more concrete and the 'yield desired results' represent the bigger picture. This has an effect on the findings.

Another weakness of the study is the absence of external validity, the findings are very suitable for the situation of Pratham and very specific, but cannot be generalized.

Also hierarchy still plays a big role in India. The people were not feeling happy with giving critique to their superior on the material. This results in the fact that important findings are not being told. A solution was sought in involving the related people in this research. These people visit the DLC very regularly and are on the 'same level' as the Balsaki's. Another weakness in the research approach is the sometimes unfinished research on some criteria. The organization is very innovative and flexible. But this sometimes resulted in the situation that a criteria was found during the analysis, but at the time of the evaluation there was no interest in this criteria anymore by the organization, a positive aspect of this for the study is, that the findings are up to date and usable.

7.4. CONCLUSION

In this conclusion the research question will be answered explicitly. The aim of this research is to answer the following research question: *"What should be the characteristics of curriculum materials for use by un(der) qualified educators in the slums of India, and how should the design and implementation processes be shaped?"*

To answer this question the three different parts of this question will be treated separately. The same arrangement will be used as in the total thesis. First the characteristics will be treated, then the design process and last the implementation process.

What should be the characteristics of curriculum material for use by un(der)qualified educators in the slums of India?

The curriculum materials should be accurate for the education of slum children of different levels, differentiation need to be provided during the activities of the curriculum material, the materials should start with the basics of the subject. Coherent with these levels is the grouping of the children. A significant part of the curriculum material need to be group activities. The teacher guidance of the materials must be prescriptive, step by step. The language needs to be easy and understandable. The teachers must understand the purpose and the content of the materials. All materials that is needed for the activities needs to be present in the trunk in the DLC, because of the

characteristics of slum education. The curriculum materials need to be consistent, safe and physically robust.

How should the design process of the curriculum materials be shaped?

The design process should follow the iterative approach of analysis, design and evaluation of the curriculum material. The design process should be based on design criteria derived from the analysis phase. These criteria need to be formulated and agreed upon in the beginning of the process. These criteria shape the total process. A planning is made on these criteria, review moments are structured by them. The process should take 3 to 4 weeks for one trunk. The formative evaluations are structured and invite the input from children and Balsaki's. Prototypes are made and used to improve the designs. Everyone in the design team follows the same process includes the same components in the design and documents and presents the design in the same way.

How should the implementation process of the curriculum materials be shaped?

The process should use micro teaching sessions to implement the curriculum material. Additionally these sessions improve the teaching skills of the teacher and introduce the content of the materials. The teachers need to learn the subject before the implementation of the materials can happen. Additionally the process need to stimulate that the materials are used in the way there are intended. Because of contextual factors the community, the principal and the teachers are important to involve in the implementation process.

7.5. RECCOMENDATIONS

The following recommendations can be made based on the discussion of the findings and the conclusion. The most visible recommendation for Pratham is concerning the sustainability the materials need to become more child-friendly, safe and physically robust. The implementation process should include more input from the teachers. And the design process need to continue in a systematic, organized manner.

A recommendation can be made, based on the research approach. This study makes use of the quality criteria as categories to make the findings meaningful. Because these criteria are principally used to judge the quality of curriculum materials, they first needed to be operationalized. This could be a study on its own. It can be done more truthful and meaningful.

Extra research can be done to the ideal way of grouping of the slum children in the DLC. From the findings on three trunks one can see that the for the art trunk the grouping on gender was most effective while the grouping for the math and science trunk was on level. Because the grouping if one of the most essential aspects of the problems with classroom management the educators are experiencing big improvements can be made in the curriculum materials. Also the role of the researcher could be differently. Facilitating a design process in combination with doing research on the quality of these designs is a risk to the objectivity of the research. A recommendation based on this aspects is to be an observer during the study.

Other extra research can be done on the way of addressing the educators in the prescriptive teacher guidance. One can imagine that the intonation of this guidance can have effects on the educators behaviour. Which tone is most effective, this will also contribute to the quality of the curriculum material.

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9. APPENDICES

9.1. A TRUNK



The project based curricular material is organized in trunks. This trunk is providing everything the child and ‘the teacher’ need for a specific subject.

This means that materials needed for learning are provided in the trunk. But also the lesson plans are inside the trunk. Teacher guidance is offered, time lines are presented.

Even assessment and monitoring sheets are provided. The Balsaki can literally pick up a lesson plan and start to teach.

The trunk contains 30 days of education for the slum children in DLC’s

9.1.1. Material

In a trunk there are two types of lesson material. These are material that belong to the activity and supportive material.

Material that belongs to the trunk are arranged by the subjects and the sections of the trunk. In the math trunk the components are arranged according to the NCERT framework. Examples of this is the following arrangement: subtraction, addition, one digit, two digits, fractions, time, value, place, shapes etc. The science trunk has a different arrangement. In this trunk the materials are divided into three categories, Matter, Biology 1 and Biology 2. The Art trunk has only got two sections. These are appreciation of Art and create. All the materials that are needed for the activities are present in the trunk (e.g. clay, human skeleton, markers, tape, puzzles). Also supportive materials is inside the trunk. Pencils and papers are provided in order to execute the activities.

9.1.2. Teacher guidance

All activities have teacher guidance. This guidance is offered in three types of cards. These are the general cards, the activity cards and the assessment cards.

The general cards are cards which provides information on how to make the education child-centred and how to group the children. Also an index card is provides and a timeline/planning is present in the general cards. The assessment cards provide information on how to perform the assessment, how to keep track on children and how to report the found information about the child to the parent. Also extra reading materials on the content is provided. These cards give background information to the teachers about for example modern art or solid and liquids.

Activity cards

For each activity there is one activity card. This cards gives step-by-step information on how to do the activity with the children. The activity cards contain a page number, title, the ILO, the time, materials, activity steps, notes for the teacher (food for thought), do's & don'ts, and differentiation tips.

1 ART TRUNK: ACTIVITY 1 FOR CREATE (4 DAYS, 12 HRS)

NO	ACTIVITY STEPS	GROUP SIZE	TIME
1.1	DRAW YOUR LANDSCAPE	1-5 MS	1-5 MS
1.2	DRAW WHAT YOU SEE	1-5 MS	1-5 MS
1.3	FIND AND ARTICULATE THE DIFFERENCE	1-5 MS	1-5 MS
1.4	DRAW A LANDSCAPE USING ALL THE VISUAL ELEMENTS	1-5 MS	1-5 MS
1.5	MAKE YOUR LANDSCAPE COLLAGE	1-5 MS	1-5 MS
TOTAL			

2 ART TRUNK: ACTIVITY 1-1 FOR CREATE (1/2 DAY, 1-5 HRS)

1. _____

2. _____

3. _____

4. _____

5. _____

FOOD FOR THOUGHT

DO'S FOR THE TEACHER

DON'TS FOR THE TEACHER

SCAFFOLDING IDEAS FOR YOUNGER CHILDREN

IDEAS FOR REMAINING ACTIVITIES FOR CHILDREN WHO HAVE GENUINELY FINISHED THE GIVEN ACTIVITY

INDIVIDUAL ACTIVITY

GROUP ACTIVITY

9.2. AN IMPRESSION OF PRATHAM

