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# Designing content for cross-media Publishing



Helsinki Metropolia University of Applied Sciences

Bachelor of Engineering

Media Engineering

Thesis

12 April 2016

Author Title	Tsedey Metasebia Designing content for cross-media Publishing Ethiopian children's book
Number of Pages Date	47 pages 12 April 2016
Degree	Bachelor Degree
Degree Programme	Media Engineering
Specialisation option	Audiovisual technology and Print Media
Instructor(s)	Jonna Eriksson Senior Lecturer Audio-visual technology
<p>Media has been given little value for its potential influence on children. One area of concern is how early media makes impact on the intellectual development and educational achievement of children. This report provides on how to take full advantage of the positive effects of use of educational media for children, diminishing the negative effects.</p> <p>This research is based on the production of content for cross media publishing. The research project aims to make a mixed content of digital and print media. The aim is mainly to research best design formats combination to offer better and healthy learning material helpful for development for children. The outcome of the production consists of a book, audio disc, card game and website. It gives the opportunity for parents, educators to pick and feed balanced amounts of on and off screen media using different platforms.</p> <p>This project research's aim is to inform educational media content designers and educational program producers, educators, caregivers, and others about the possibility of constructive influence of use of educational media on children. Choosing age-appropriate, well-designed programs for their children and providing through mixed platforms using cross media enables to create a balanced media use.</p>	
Keywords	Educational media, cross media

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# Introduction

What are the positive and negative influences of educational media use on children intellectual growth? How can parents engage in their children's use of digital media? How can content be designed for cross media publishing in inter mediating the weight of electronic media? These and related questions are to be observed in the entries that follow. Professionals can use research to guide the content design, platform choice and user engagement in a digital media environment. This research focus in experimenting how content can be designed through mixed media platform publishing for children's best learning practices using digital media, which include television, tablets, computers and smartphones.

Various researches evidently stress on the importance of proper content designed for cross media publishing inter-mediating and creating a healthy balance between the weight of electronic media and off screen media platforms. The platforms used and the content provided can have positive and negative effects on reasoning skills and academic achievement. Early acquaintance to age-appropriate programs designed around an educational curriculum can help with intellectual enhancement. However, children's use of inappropriate content and excessive screen exposure time is related with worse intellectual development and lesser academic achievement [1].

## 1.1 Problem statement

Media comes in various formats everywhere. It's very hard to find a home these days with-out a television. It's becoming impossible to find an automobile without a music player. Television and movies can even be watched on a Smartphone. Electronic media is everywhere, and even the youngest children are exposed to it. Television, Internet, video games all compete for our children's devotion. These days most children have access to various media platforms such as: phones, computers, televisions and other electronic platforms.

Some of the negative effects of excessive media use include lack of attention difficulties, lack of social interaction, learning difficulties, sleep and eating disorders, and obesity. In addition view of unsupervised content by children on the Internet and cell phones can lead towards unlawful and dangerous behaviors. This research aims to help parents, teachers and media producers understand the influence of media on children's educational advancement, while proposing advices on supervising time spent with various media [2].

## 1.2 Background of the project

The research is based on a project to produce an educational program for children. The background planning and designing of the production was started by Fikir Media. Which is a company based in Finland. The company has been working the production of various educational materials for Ethiopian children.

The inspiration to work on the project came from personal experience. There are not enough books available for Ethiopian children. Most of the books that are available are not well designed and do not effectively help the children to advance in their intellectual growth. The human mind acquires information and learns through the five sense organs. Out of the five sense organs the sense of sight and hearing provide higher percentage of providing and retaining information to the brain. Based on these scientific facts, designing educational materials which activate and make best use of the sense of sight and hearing is very important for children.

Another scientific factor in the background motivation of this project is the effects of colors in designing learning materials and spaces for children. Color is a powerful design element that produces deep psychological and physiological effects in children. Studies have shown the relationship between color, emotions, and the effects created on children's academic performance. Various studies have proved that rather than black and white, colorful learning materials have great effect in increasing the interest and ability of children's mind for learning [2].

This project attempts to examine the employment of content design and cross-media publishing platform. Well-designed content, using the mixed passage of audio-visual and being appealing to the senses of sight and hearing of children is the foundation motivation for the background of the project. Besides the power of audio and visual media content, choosing and mixing different platforms of publishing is also one of the most important focuses of this research project.

## 1.3 Purpose, scope and goal

The goal of this project is to produce educational programs for children through cross-media publishing. The target group of the programs produced are children under age seven. The products of the project consist of four elements. It aims to compile the use of print, hybrid, television and online media, which include:-

- Book – The project includes the graphics design and printing of children book. The book is designed for Ethiopian children in Amharic language. It uses full color. The total number of pages of the book is fifty two including the cover pages. During the project different papers

and methods of printing and binding children books will be experimented. It is one of the purposes of the project to examine using of the long lasting and appropriate papers and binding mechanism. The book also contains a hybrid content which can be scanned to connect to the website. It also contains the audio video DVD attached to its cover.

- Website – The website is designed for children, parents and educators. The design puts into consideration the choice of appropriate and attractive colors. Since the targeted users are children, the user interface and layout of the pages are also designed with simple, easy access and clear layout.
- Card board games – The card games are related with the theme and content of the other products. These are simple card games. It can help to motivate the involvement of the child to interact with other peers. Card board games have various positive effects on children in helping them have a break time off screen.
- Audio/ Video DVD – The audio visual DVD is aimed to support the book. It is aimed to help educators and parents. The content is designed parallel with the books. It is used to help in reading and giving more depth using video.

Each of the above products are going to be produced parallel. The project is going to experiment different designs and publishing ways to test with users the best possible method within the time given. Tests are going to be carried out using the products with the targeted user groups.

## 1.4 Scientific and social relevance

Each of the media platforms used has their own strong and weak sides. Each of these media publishing platforms has different potentials in helping the delivery of information to the mind. They use different sense organs. The platforms used have different psychological and social effects on the behavior of the user. Too much intake of use of some of the digital media content platforms can create negative effects on the social behavior and psychological concentration negative effects. It can also create physical health disorders like lack of sleep and unhealthy appetite if used inappropriately. Some of the off-screen platforms can create healthy social interaction. They can be used in group learning [1].

This is when the cross media publishing comes in. It helps as a buffet. The user can mix and take balanced enough amounts of different materials through different platforms. It is important focus of the research to find out how the design can affect the behavior of the user to mix and use the materials.

Education is an important key in the development of a society. For someone who has all the natural resources available, it is better to help grow the ability, knowledge and skills to grow its own necessities than provide. I believe educating children starting from early age can help in shaping

the future of the growth, change of a nation. Using effective learning materials and motivating the right senses to advance effective intellectual development is important for all children. The education of children can have positive effects in changing the health, work habits, social interactions, positive responsibilities of a community and a nation at a larger scale.

## 2. Literature overview

Cross-media publishing is a method where publications are created, belonging to different media platforms such as print, online, mobile, etc., yet based on a common database and content. It is also known as single source publishing. The content is media-neutral managed and stored. Texts, images and other graphic elements are stored unaltered and unformatted. For photos, this means that they deposited in the best quality available and only for actual use, for example, within a website, be reduced to the required quality level.

The important reason cross-media was publishing for the first time was in connection with the Internet, as web presence, online publication and print media can be created automatically. This not only allows a flexible and cost-effective production, but also maximum transparency in the organization, management and maintenance of the data and the avoidance of errors and redundancies in data management [3].

### 2.1 Use of cross media for children education

Digital media provide multiple possibilities and options for parents to increase the interest and the ability of their children's learning ability. One of the most effective means is using educational materials published through different platforms. Parents have the responsibility in guiding their children to major the content and and the device crossing point. There is huge disagreement among educators and care givers if children learn anything useful or valuable from digital technology media content until the age of two. Therefore, the focus of this research paper focuses and the target group is for children from the age of three to seven [4].

Children prefer to easily ingest certain media better than another just as they prefer one food from another. Just as food intake media diets are healthier with a limited amount of intake and mixed balanced diet of platforms [4]. For example, children between the age of three to seven who frequently watch educational programs through television, internet or games were better prepared intellectually when they start school. Children learn basic skills such as their language skills in vocabulary, grammar and counting from educational programs as well as social interactive abilities such as learning to be patient which can be useful in pedagogic situations.

Children who are watching educational programs mixing through television, internet books and games during the kindergarten or before starting school years also had better school performances and were more creative. Research findings suggest that advantages when children watch appropriately designed educational programs during their early age years, early shaping and guiding paths in children set a foundation that can lead to long-term [4].

The kind of content and publishing platform of the program are very important. Other researches show that children learn better from viewing educational program when their parent, care giver or educator is involved with them during the viewing experience [5]. Preschool-aged children have difficulty understanding what the central idea of the program is, which makes it difficult for them to get the educational messages out of the program. Adults who view the educational with children can assist them understand the central message in the following ways:

- 1) By explain to the children the central message of the program, and
- 2) By performing in a form of role playing or drama the key parts of the story messages. Verbally explaining is very useful for girls to understand situational information. Role playing works well especially when teaching early aged young children translate socially interactive messages into their own actions. Building on this system in a mobile or tablet game where the content is offered in a form of storytelling with break in proceedings built in for preschool-aged, bring about an effective early learning strategy.

Screen media platforms and using digital devices provide interactive experiences through touch and other means using stories and games for designing various educational programs. When using these kind of digital platforms with children, it is important to keep the children be involved, attentive, and concentrating. One way to increase and keep children's attention and engagement is by letting children have control over the digital technology device being used. Various research show that preschool-aged children lose interest in an educational program in a shorter time when an adult controls the device being used, but that they can have longer interest and concentration on the program or content when the child has control of the device or platform being used [5].

When for example reading a story with children through computer or laptop, children who have better decision-making skills can take control of the mouse, and the parents be there to coach their children when assistance is needed. By contrast, children who have poorer decision-making skills usually do not take control of the mouse; in these circumstances, parents need to spend more time explaining to their children about the story [6].

Improving children's learning from digital media to other media platforms is very important. Building on the children's media usage habits, parents can assist their children's media interactions in several ways. The first task for parents is that they should choose appropriate content educational programs through mixed platform. Selecting educational videos and computer programs requires being a knowledgeable parent. Choosing programs that are conventionally labelled as educational content is crucial. Pikkukakonnen, for instance, is known for its educational and entertaining children programs in Finland. Parents should check to see if there are educational advisors who participated in creating the program. When there are educational advisors, there will usually be a

target age group for the program. It is important to make sure that the viewer child falls into that target age group. Parents should also find out the learning objectives of the educational program and make sure that the content actually give emphasis to those learning goals set. It is good practice also to use video format materials and check if it also have materials online to help give emphasis to the content. A website that has parent section is a good indication, especially if it suggests different activities to help the child practice the lessons of the educational program content to real-life situations. It is important to choose educational programs that the child can choose to enjoy. It is important for parents to be enduring if the child wants to return to the same activity over and over. Even if repetition can be boring for the adult but it helps children to master the content [7].

It is a usual practice among most parents to leave children watching television or using computer program while the parents do house hold tasks like cooking or other tasks. Learning is always paramount advantage for children when the parent involves and interacts with the children to master understanding the content and do the tasks required. It is important for parents to create some time in the day so that parents and children can view or use content and create innovative approaches to the interactive experiences that are now part of everyday life. For intellectual capacity of television, videos, and computer stories, parents can view the programs together with the children and interact with their children as they master the content, using role playing and communicative labeling to help their child understand the message [8].

Although children are more interested when they are in control of the device being used as platform but in some cases for instant in using computer programs the use of the mouse is not easy for children because of the motor skills needed to move the cursor. Parents can support their children in the beginning by putting their hand on top of their child's hand and guiding them in the clicking process. As the child's motor skills advance, the child can be allowed to use the mouse alone to click and drag the content. Some websites, such as Nickelodeon's [nickjr.com](http://nickjr.com), have many fun activities that are intended to teach children with their early age motor skills on how to click and drag content. However, too much mouse clicking by children, can interfere with understanding the story if the children tend to more be concerned in the mouse clicking task and ignore following up the story. In this case, parents can help the children, in doing the two tasks in turns reading the story and then encouraging their child to use the mouse. Digital media technology can encourage children to interact, give their thoughts and be creative while learning. It is essential for content designers, educators and parents to help the children take advantage of the experiences that these new kinds of technologies provide for learning and creativity, engaging children to learn in a way that amuses as well as educates [9].

## 2.2 Understanding how to design for cross-media publishing

The main purpose of publishing through cross media platforms is make contents accessible to users through different devices and platforms. In this project we research how the multiple platform access and use of media can be studied and utilized to introduce a new design framework to enhance the learning ability of children through media and influence in a positive and healthier way.

These days most people use multiple devices daily. Most of the tasks we accomplish during the day has deal with interaction with a digital device, facilitating our activities in learning, getting services, make purchases and sale, connect with online community, entertain ourselves and manage different aspects of daily life.

There is considerably huge amount of hours are spent using electronic devices daily – intermingling mobile phones, clicking and browsing the internet on laptops and personal computers, playing games, watching videos and listening to music on tablets, watching different movies and programs on television, and playing game through phone, tablet, consoles or television. Most children spend more time simultaneously interacting with one or two devices like with mobiles, tablets, personal computers and laptops than with their peers. This habit increases with age.

The quantity of different types of apparatuses used by different age group users globally exceeds the number of population on the planet. By the year 2020, the number of devices used by people is estimated to exceed more than 24 billion [10]. This unimaginable number escalation show the growing use and role of digital devices in our daily life and also signals one person uses more than one type of device. Many people nowadays have different devices in their homes, bags, cars and everywhere – personal computers, mobile phones, tablets, Television and more- Most users use these devices use these devices by interchanging and mixing between different devices to accomplish what they want to do. Most content providers have the challenge lying on them to design their contents to be published through different devices, different software and browsers. Above these points the using habits and usability of the devices differ among one another. Some of the devices can be interactive allowing not only providing one way information channeling but both ways. Each different devices play important role and the content designer needs to utilize how these different devices and platforms can be used connectively. This culture and user habit of using multiple devices and the need for the content provider to design for connected devices lays a foundation for ecosystem of platforms [10].

The idea of an ecosystem is a term commonly used in the field of science like Biology. Biologists use the term ecosystem to refer to the connections among living things and non-living things in the natural world science – the term refers to living organisms living together as a community in

combination with their interaction to non-living things in the world and different non-living elements that affect life interrelating as a organization. An ecosystem fundamentally means a system or set of interactive elements in a bigger system creating a bigger networked system which is greater than the individual elements or parts. [10].



Figure 1: An ecosystem of connected devices [10]

The increase in the number and types of portable or mobile devices used by many people nowadays is creating influence in changing the way people search for, understand and interact with devices and in their social interaction. The main purpose of this project and research is to understand the how these multiple types of devices can be connected and best used to serve in providing a healthy educational content for children. This research also focuses not only on digital devices but print media as well.

For users who use these interrelated eco system of devises, the designer needs to design a content that can replicate similar or different experience on different devices. The designed contents published through the cross media platforms can be offered independent access for independent device or platform. Developing an ecosystem approach enables to capture the different user needs and circumstances that go together with changing different platforms or devices. This ecosystem context driven approach allows the content designer to deliver the right content at the right time through the right platform different for different user preference. [11].

## 2.3 Main factors in publishing for children

Prior to the development of children's ability to read and understand words, they learn to read images. There is also a popular saying pictures speak thousand words. Pictures can be more explanatory than words for both children and adults. As a result, the books children choose to read help them develop their own imagination stories based on visual understandings. Introducing children to art using a range of illustrations will have the greatest appeal. Some of the factors to consider include the following [13]:

- Book containing eye grabbing, simple, large, colorful pictures decreases distraction for children.
- Too many parts and information puzzle early aged children.
- The ease of turning the pages easy to turn is also one factor. Hard cover books are easier to successfully turn pages for pre-school aged. This also applies for children who are handicapped, making it easy for them until they develop their motor skills.
- Most children prefer stories written in a fast pace scheme and having a happy-ever-after ending.
- Since parents' attitude toward reading will influence the child, it is important to keep in mind if an adult enjoy reading the book.
- Programs for children should teach or carry a message that holds good principles can be entwined throughout in an intelligent methodology.
- Programs produced for children must be free of any kind of unfairness including biases related to gender or race.
- The repetitive quality of a program is one factor to bear in mind making the children be interested to request repeatedly.
- Children's program language usually use rhyming words, an attention-grabbing design, funny characters and a surprising closing.

### Design is the main deciding factor

The quality of the graphics design is an important factor that needs to be given great consideration when publishers are producing educational materials for children. The final material can be published either through a book, website, other printable product or electronic screen device. Whatever the case may be a designer needs the content to be created with less of **text** and more of expressive **image** content that is appealing to children. The idea of the text within the book needs to be brought to life through the artwork. It takes great skill to create a children's book that can capture the attention of young kids. It is also important that you choose an **illustration** using **colors**. This will inspire increasing the learning desire and ability of the children's mind.

## Affordable that doesn't affect the Quality

Not only is quality a consideration, but **cost** is also an important factor. As a publisher, one needs to take cost into account without sacrificing the finished product of the children's program produced. The artwork designs need to be original and captivating, but also affordable. This can be a difficult balance to achieve when searching for artwork services. Even though it is difficult, it is not impossible to find affordability that still holds quality.

## 2.4 Impact of using educational media on children

The term educational media speak of use of different formats of audio, visual and audio-visual resources for teaching aid purposes. Different kinds of platforms can be used to publish the contents. Some of the most commonly used publishing platforms include digital screen devices, print media, hybrid media, toys and etc... Cross media refers to the publishing of produced content through different platforms, devices, formats and containing supplementary contents. The main idea in publishing through cross media is making similar content available through different ways to give different and healthy learning experience for users. A content can be designed for a video, a supplementary message can be designed to be published through books or other print media or through card board games which encourage social interaction in playing with others. The cross media publishing provides a multi device experience for the user. [14,1045].

To provide a healthy media intake for young children, parents will need to supervise the contents and platforms chosen by the children. Before allowing the children to watch a program, it is a common practice to check the ratings and the target age group the program is produced for. This helps to make sure that the programs viewed by the children do not contain any inappropriate negative messages in regards to violence, sexuality or abuse of addictive materials. By regulated use of educational media materials and non-electronic formats such as reading books, and playing interactive board games, parents can aid guide their children's media experience become effective. Emerging researches tell us that proper uses of technology and educational programs are effective, appealing, and empowering for children. Carefully supervised screen digital media use, with worth content for limited time experience can benefit children over age three. Too much time spent using media for children damages healthy development and growth, regardless of quality of content. Young children can advantage and learn through combined digital media arrangement with other peers use if suitable computer program software is chosen. Children can Parents must ponder the educational advantages of use of technology for their toddlers than to consider the downsides [15].

Media's presence in children's lives is totally unavoidable. Different screen media technologies and devices are available being portable and affordable. Researches show that children who spend very long hours using screen media platforms will develop a loss of interest in what is there and happening around them. This includes decrease of interest in observing their surroundings, interacting with peers or people around them playing with their friends, and spending quality time with family. As these children get older, excessive screen time can negatively affect their physical activities like actively moving and running around, their interest and ability in reading, doing their homework. Television is an influential platform providing entertainment and educating viewers formally and informally, positively and negatively. Depending on different circumstances and the amount of intake the influence of television can be negative or positive. Some studies tell that watching television for longer hours can decrease attention span, change the physical appearance and wellbeing of the body, increase obesity working together with other factors, decrease confidence, and develop violent and anti-social conducts when exposure is unlimited[16].

Through watching television children may also be exposed to advertising contents. Early aged children get easily persuaded and influenced by the advertising contents because of their undeveloped ability to choose their intake and judge yet. Studies show that there are many possibilities to use television in an advantageous ways for kids [17]. Some of these advantages include:

- Television can provide children with words and expressions in increasing their vocabulary and communication skills
- Television programs can be used to produce educational contents in any field of study. Whether the children get any use out of the programs they watch depends on the specific design and viewing time.
- Television can help children to develop their general knowledge concerning different matters that they wouldn't easily know about otherwise
- Television has the potential to effectively create and spread awareness concerning different problems related to society or environment
- The likelihood to be Obese: Children who consistently spend more than four hours per day watching TV are more likely to be overweight. As well as encouraging an inactive lifestyle, television can

Even if television has the potential to make advantageous effects for children, depending on different situations it can also make negative effects. Depending on the content of the program being watched, children can develop negative characters such as:

- Being fearful
- Being violent
- Becoming obese because of developing inactive lifestyle
- Some television advertisements or programs contents promote junk food intake

It is difficult to determine the exact age children are able to benefit from using media. Current researches tell that children can benefit from the use of multimedia materials when they become above the age of three. Parents who manage to control and provide appropriate and balanced media contents for their children are able to help their children develop their communication skills. It is considered that children's devotion to digitalized educational programs advances in the age of between 1.5 and 2.5 years [18].

That does not mean that use of digital media can and should replace the parent-child communication and interactive plays. For children to benefit the best out of use of educational media, the superlative approach is for the parents to be with the child and participate, and to use it as a chance for conversation and interactive communication abilities and more desire to go to school. Studies also show that interactions with parents and peers is the most influential key to maintain their growth in all wise [19].

Researches recommend that parents should make some space in the house where there is no access for digital screen technology of any type. The best practice for children's exposure to screen media platforms is a maximum of two hours in a day. Even for the limited amount of time the content should be checked before viewing and monitored while viewing. It is important for children to spend time interacting with others, playing outdoors, exploring their surroundings, reading books, and increasing their imaginations and developing their communication abilities through free self-play [14].

## 2.5 Prior published Ethiopian children educational materials

Previously published studies show that in developing countries one in four children is unable to read. Supplementary Amharic books are limited. Most are poor quality and are not appealing for children. To make matters worse Amharic is one of the most difficult languages to learn. It has more than 230 characters. Children are mostly taught through black board and black and white books. That is why working in the production of educational materials for Ethiopian children is essential to fill the wide gap. It is important to provide educational materials be accessible to every child and every classrooms and public libraries. Every child deserves quality education regardless of their economic status. It is a challenge to provide quality educational materials and make it affordable and accessible to the majority of the society [20].

There are various priory published Ethiopian children educational materials. The most commonly published and used educational material for Ethiopian children is book. There are school text books prepared and published by the ministry of education. Most of the other books' content focuses on tales and bed time stories. There are a few countable using one hand's fingers

educational materials published through cross media. The most commonly used platforms by users include books, VCD, Audio Cd, Satellite television, mobile and personal computers.



Figure 2: Different prior published Ethiopian children books

Source: Metro African (2012) [ 21]

Television is a very powerful medium to transmit information on different issues. It has the power to capture the attention of audiences and has a long lasting effect on their memory. Creating appropriate children television programs is very essential, because television and information acquired through sight and hearing have the ability to shape the way children think and behave. Using graphics illustration and animation characters are a huge part of children's entertainment. In Ethiopia, there are only a few animation works and no children movies available on television or Dvd; the most famous children program that is transmitted weekly is “Tsehay memar tewodalech,” which means “The sun likes learning,”. The program is an animated short TV series produced by a local production company called Whizz Kids. This animated series focuses on the importance of reading and education; it teaches children how education is an invaluable asset. The main character of the series shows children how she solves problems by reading books. “Tsehay memar tewodalech” uses cross media publishing platforms mixing between television, books, posters and other printable materials [22].



Figure 3: Use of print and Av platforms

Source: Sun Loves Learning (2006) [22]

## 2.6 Strategy in the development of a cross Media

The development of cross media platform is achieved through 3Cs framework which consists of three key strategies i.e. reliable, uninterrupted and balancing. In this century of using connected devices users are developing one important habit: they want to be able to access a product through different screens and platforms as possible [23]. Users desire a program to be able to run through the core devices used commonly such as: mobile phone, tablet, computer and television. It is important for the designer to consider this complexity of the devices that are already available on the market and those that will be coming in the near future. It is important for the designer to provide a simple product to enable the users with ease of use without overwhelming.

As users habit of using a single platform is becoming history, so is designing for a single platform. Cross media platform publishing is like an eco-system. In the eco-system. Connected devices can form a multi device experience as a connected group (rather than just a set of solo devices). The multi device use leads to any of the three design approaches – consistent design, continuous design, and complementary content design – or a combination of the three. Different users have

access and choose to use different platforms and the purposes people use devices for also differs. Most people use

## The 3 Cs Model: a cross device experience

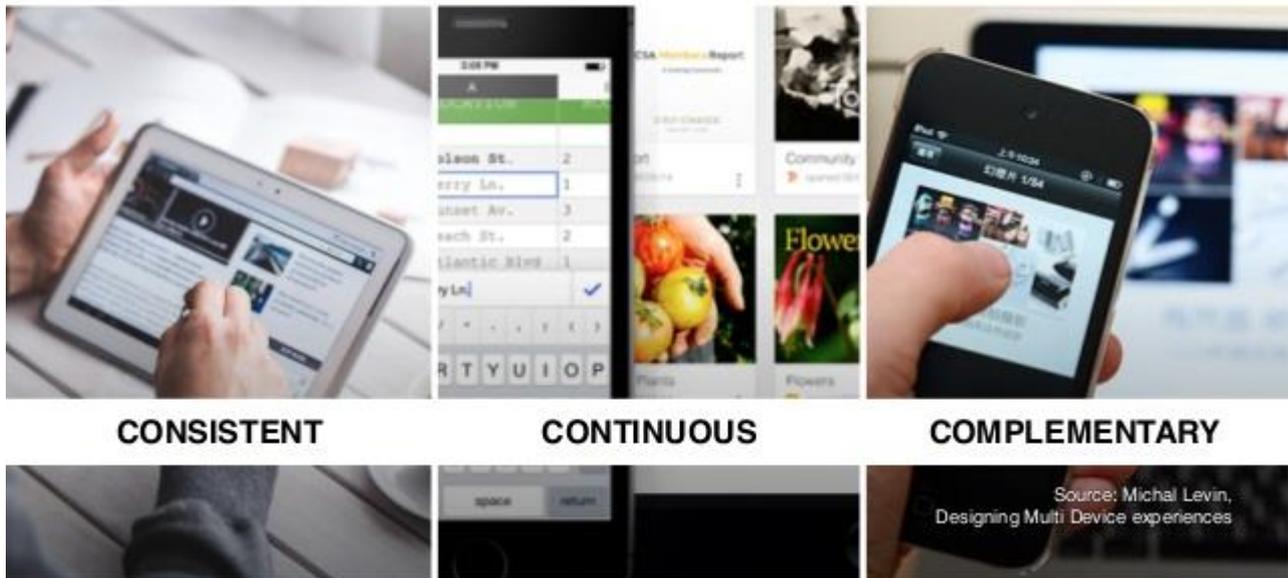


Figure 4: The 3c Model [23]

In designing content it is very important to bear in mind the different platforms of publishing and devices used by users. Similar to the analogy of music composition, different instruments perform entirely different music. They have different instruments, notes and sounds. But in an orchestra each of these instruments play together to give out a harmonized more beautiful music. As the conductor in the orchestra decides which instrument plays which note, in cross media publishing the content designer decides the content and experience provided through different platforms consistently, continuously and in a complementing manner [23].

### 3. Methods and materials

In this chapter I will explain the methods and materials used during the project's production. The production work included tasks to design content through the different cross-media publishing platforms. I will also explain the tools and process used to produce and publish the educational materials product. During and after the completion of the production of the materials different tests were implemented together with the target users. The results from those user tests and the points learnt will also be discussed in the chapters below.

#### 3.1 The project

The project aimed to produce educational programs for Ethiopian children to be published through different platforms. The main aim of the project is to make educational programs attractive, accessible in different formats and making it appealing and satisfactory for children's interest and increasing their desire to learn. While using the educational content through different platforms the children engage in different activities. They are learning a lot and memorizing the same content being repeated through different platform. The variety of the platforms used publishes provides fun and engages the children enjoying learning. The platforms chosen to publish and the type of the design of the content materials looks as the following:-

- Book – It is a book for children under the age of seven. The graphics and content was designed taking into consideration the factors discussed in the previous chapter. One of the first factor that was put into consideration and action was color. The colors were selected in a way that the look of the book can appear appealing for children motivating them to read the book or want their parents to read for them in case of early age children. The other factor that was used in designing was use of illustrations to describe the words. The text on the page was accompanied together with relative and explanatory images. Most of the age range of kids in this project are still too young to read the words. So most under age of five or even six would learn more from the pictures and they will need the supervision and help of an adult to read for them.
  - The book consists of cover page plus 32 inside pages. The content is designed in a way children can read story and learn and side by side do exercises to digest what they read. The final print of the book shall be tested using different weights of papers. This is done so to test which paper and binding method can last longer and be more suitable for children to read and do exercises on. The book is the initial design root for the other platforms.

- Website – The website is designed for children, parents and educators. The content and design used for the website is parallel with the other platforms. Most of the content of the website is taken from the design for the book and the DVD. The website was kept as simple as possible. It has only four menu tabs. On the home page there is slide of pictures and a video that auto-plays when the page is run.
  - The website creates an opportunity to combine the book content together with the DVD. Users can read the book through the website. While opening the book online it has a read for me option. The read for me option plays the audio related to the page being read. The user can pause and play, they can also control volume of the reader. It can be considered as an assistant for the parent, care giver or teacher. The website does what the adult supervisor is supposed to do, which is reading to the child.
  - Since spending too much time on the screen is not advisable for children, according to this research paper and previously made various studies, it is not recommend for users to frequently and unnecessarily use online digital screen media for children. The website can be used on any device and different browsers.
- Card board games – The card games are simple group games. The advantage of the use of the card board games is that they encourage the users to play together with their peers. it encourages and develops social interaction. The designed and printed card board games for this specific project included a card memory game and board quiz game. Both are designed in a way to help the children revise and add to their learning while having fun. Creating discussions among the peers and with the adult in supervision, it can also help the children start discussions and develop their communication skills. The content and graphics of the card board games are taken from the book. That will help the learning of the child because of repetition of similar content through different medium and different activities, in that way the user can acquire the message being passed across.
- Audio/ Video DVD – The audio visual content is published through the Dvd and website. The same content is used twice through different platforms to satisfy the convenience and access of platforms for users in different locations. For example for an Ethiopian child using the product in Ethiopia Dvd player is easily accessible in every home and schools. But if you consider the network connectivity is usually so slow to play an audio-visual content through an online medium. So in this user case, it is easier to use the dvd together with the book when the read for me demanded.

In case of many Ethiopians living abroad, they have easier and faster access for an internet connection. They can easily access the audio visual content through the website. They can use multiple devices accessible in their pockets, homes and schools. The content of the audio and visual is designed in a way to supplement together with the other medium contents.

### 3.1.1 Design

The different elements of the products of this project were designed parallel. There was only some modifications made among each other to fit the requirement of medium being used in each case. The design will be discussed below in the case of each platform.

- **Book** - The book was initially designed for an A4 international standard paper size. But later after a print test the size was changed to a little shorter in height wise. It gave the book a look of more of a square than a standard rectangle A4 paper booklet. The square looks more appealing and suitable to handle and use. The specific size of the book in pixel dimension and document size is as shown in the figure below.

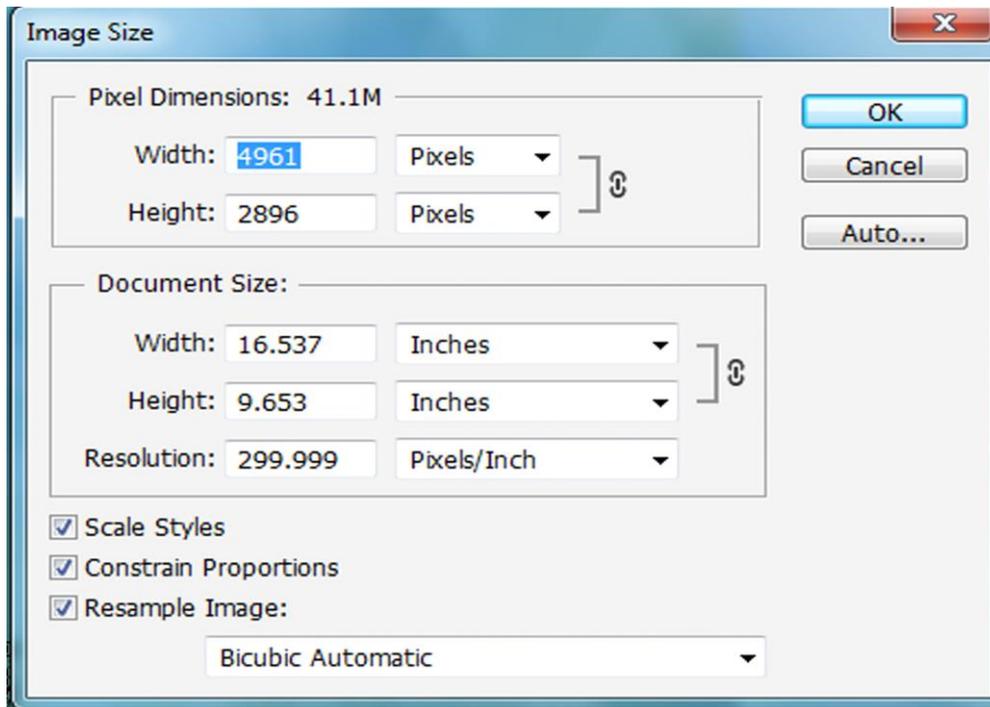


Figure 5: Pixel dimensions and document size

As shown in the figure above, the resolution is a very important factor while designing for print. It is recommended that the 300 pixels / inch resolution is used for printable design. The color mode of the design was CMYK. CMYK is a color mode used commonly for printing. It stands for the colors cyan, magenta, yellow and black. For the texts a 100 percent full black was used. In the case of some printing methods, they apply the four layers using different plates. And the colors are put as a layer one over the other. In case of

text, if the layers align a bit out of the place, the text will be blurred. So to prevent those cases, it is advised to use 100% of all colors to make sure the text takes full color. In the case of digital printing machines this wouldn't be a matter to be concerned about.

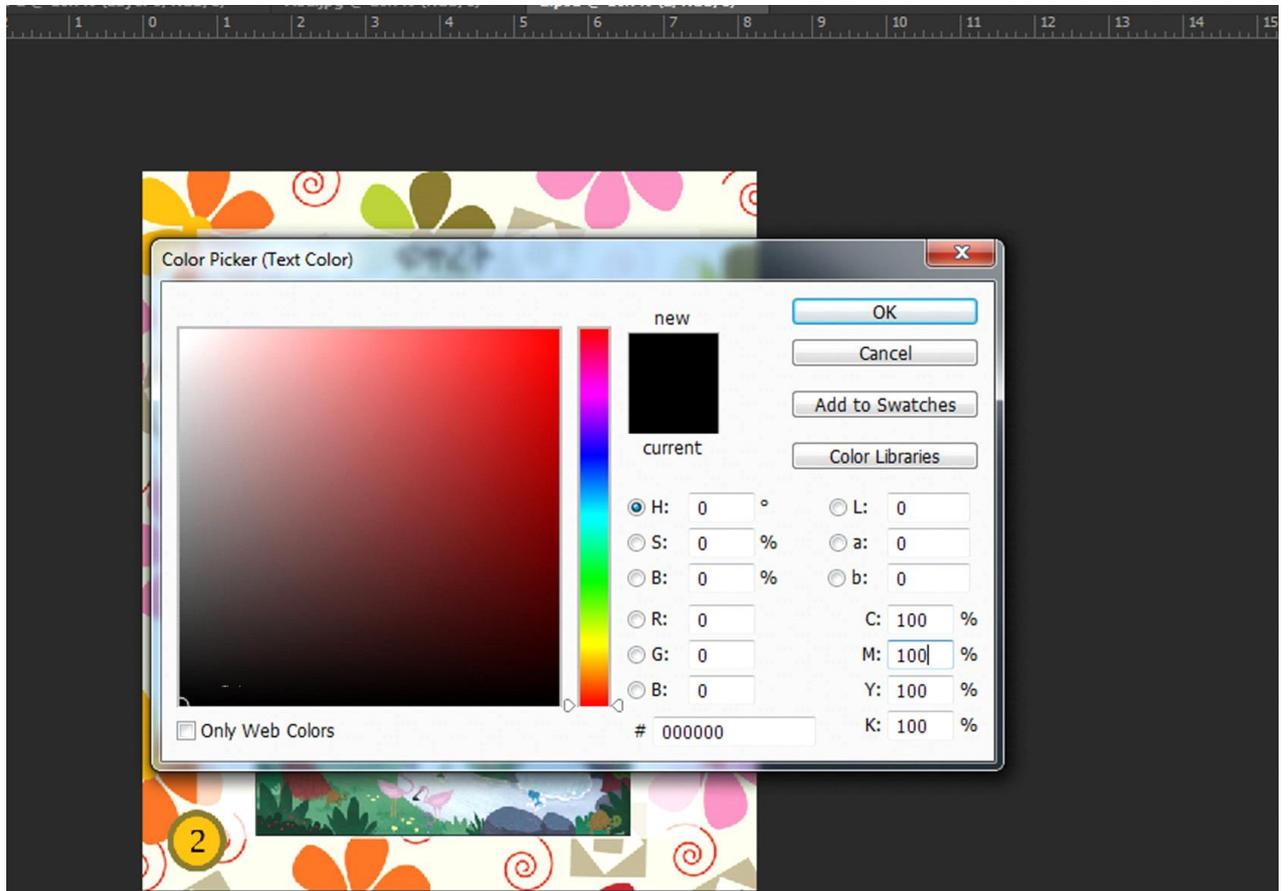


Figure 6: Color picking for text

A family of bright and happy colors was chosen to start the design of the book. Each page is designed in a way to keep the family colors in a page similar. So colors for shapes and texts are picked from the existing color on the page. The design was made in a way it is attractive for children using illustration graphics. Each page was designed to keep it as simple as possible. It was designed in a way to make clear and easy access of the content.

**Website Design:** The website was built under the home page of Fikir Media, which is the company behind the background study and production of the whole project. From the home page of the Fikir Media, the website for this project is accessible through two ways. One of them is, there is a button under the menu at the right side corner directing to the website. And the other means of access is under the current projects, this project is listed. When the name under the current projects list is clicked, it directs to the website. The reason why the

website was built under the fikir media's website was because of financial reasons. It was made so to minimize domain purchase expenses.



Figure 7: Fikir media website

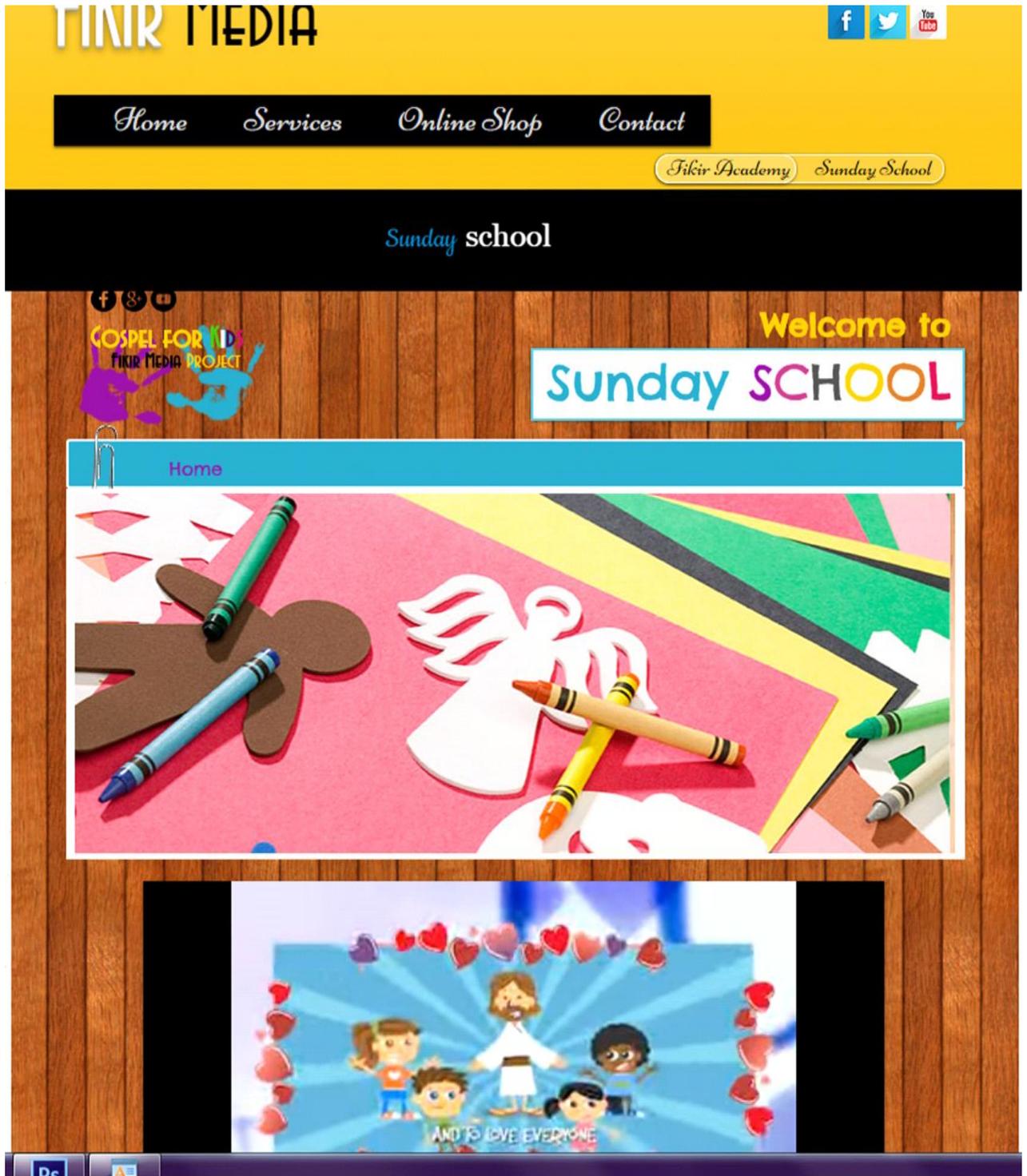


Figure 8: Project's website

The website contains more of graphics and less of texts. There is more of pictures and video. The user interface was designed in a way users can access the educational materials easily through multiple ways. The main content of the educational materials is put under the kids' group gallery. The gallery can be accessed through 'More videos' and also through 'Go to Gallery' buttons on the home page. Under the kids' group the materials can

be accessed also by clicking on the age groups pictures or text and by directly clicking on the 'go to gallery' button.

Card games: The card games graphics design is directly taken from the book. The cards were designed on an international standard A4 size paper. The colors used were picked from the family colors used for the book. The standard 3mm bleed was left from the borders of the A4 size paper. One A4 size paper was equally divided into 16 cards.

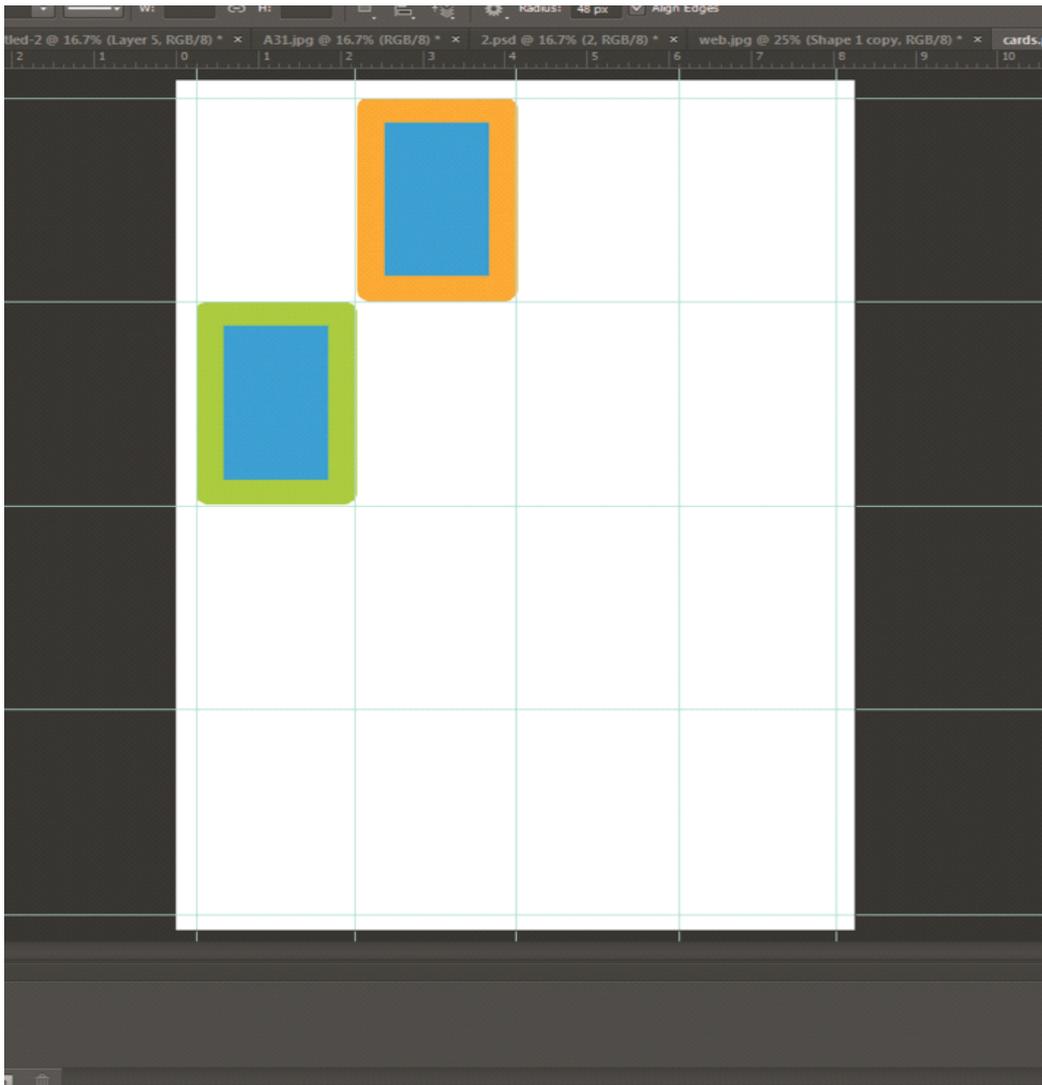


Figure 9: A4 size with bleed marks

Initially the design was made for the cards to have a curved edge. During printing and cutting the edges into the curves was a challenge. In the printing industries the method used to cut print products into different shapes is known as die cut. Die-cutting is a process used in many different industries to cut paper into a specific shape using a steel cutting die. It can be used to punch out a decorative shape or pattern to incorporate within a larger

piece, or it can be used to create the main shape of an object by cutting the entire sheet of paper in a distinct/designed way. More simply put: for us its way of making a hole in paper in a desired shape using the same presses that we use for letterpress printing.

The standard CMYK color mode and 300pi resolution was chosen for the card design. The cards are aimed for memory game. To help the children remember similar cards color code strokes at the borders were added.

**Audio Visual content:**

The audio was recorded at a public studio. The texts were directly read from the content of the book. The stories were read in a suitable mood of storytelling. Background music was added to the audio reading. The background music was adjusted to a lower volume to be calm and not covering over the audio narration reading.

The graphics contents used in the book, website and video were taken from a public domain. The images used have creative common license. The graphics were designed and made accessible to public for a purpose of making teaching materials accessible for Sunday schools to use the materials for teaching.

The videos were edited by combining the graphics content from the book and narration audio. The videos were produced to simply make the content available besides the website and the book. The video is made accessible through new media platforms and social media networking platforms. The videos are primarily accessible through YouTube, Facebook page and group. So the videos are a way to create discussion and bring viewers to the website. The social media is also very useful and important because users not only come to take from the content provider but they can share ideas, contents with one another. That is also one means to get feedback and to find out user needs for the content provider. The Facebook group posts and shares promote the website and invite members to visit the website.



Figure 10: Face book group

### 3.1.2 Process

The process of the production was different for the different platforms. In this section detail steps taken in the process of the production of each product element will be explained. After the steps taken in the first phase of production, some changes were made after testing with users. The steps taken in the production process are listed below:

#### Book

1. The first step in the production process of the book was planning. Determining the content, layout, number of pages, size of the page, choosing the target group... were among parts of the planning. Initially the book was intended to have only stories. Then during the production modification of plan was made to add exercises related to the stories side by side. The lay out of the stories and exercises was made side by side so that children can

have clarity for understanding. The initial planned size of the page was A4. It was changed later after test printing.

Choosing of the target group is an essential element of project planning. The age group, background of the chosen target group determines the content provided and design. In the case of this project, the target group are Ethiopian children under the age of seven. The use of different platforms for publishing helps in covering the gaps created by geographical location and access of device.

2. The second step was writing down the content of the book. Rough listing down of the order of the stories was listed. According to the list the stories were written making sure the content is correct according to the bible. The written down stories were checked together with a professional. After the checking of the stories, they were typed using the computer in Amharic language. The files were saved in word document and pdf formats. The word document file type makes it easier to make modifications, add more or delete. The pdf format is important to exchange the file with graphics design software like Adobe Photoshop.
3. The third step was collecting free graphics and pictures. It was not possible to design the whole content of graphics from scratch due to constraints of time which arises from constraint of availability of financial budget to spend time working and build team of people to contribute to the project. According to the desired quality, the type of graphics wanted were collected based on the criteria of color, simplicity and temperature.
4. The fourth step was starting graphics design of the book page by page on Adobe Photoshop. The designing work started from the front and back cover pages. The design was made on A4 size paper. When designing for print, it is important to adjust the document size resolution to 300 Pixels per inch and the color mode to CMYK. It is also very important to leave a 3mm bleed for cutting purpose. There was changes made to the design multiple times. I make a design print it and misfit something. After the modification made I show to a friend, I get comments so I make modifications again. Mainly during the testing, the children were our best feedback givers. Since the material is intended for them, they can see the good and improvable sides from their view of angle. After the design of the cover pages, the inside pages were designed. I saw previously printed other books. During the designing I tried to add the attractive points I saw from other book designs. Usually, the case is that what you plan, what you expect and what you get at the end can be far different from each other.
5. The fifth step was printing multiple times. The book was printed multiple times to check the color, size, and how it actually looks as a book. It was also printed twice for testing purposes. The final printing was made using different paper types. It was made so to test and see how the paper affects the look. Different weights of papers were also used. The

ticker the gram of paper used is suggested for the intended target group. That was done so to avoid tearing of the pages.

### **Website**

1. The first step in the process of building the website was planning. What contents are going to be published through the website? How many tabs do we need to have? There were some of the important questions answered in planning the website building. At first the website had only three tabs. Those are the tabs that are visible in the menu currently. The only difference was the kids and youth group were under one tab. Then for the simplicity of access the tabs were made into four. Currently the website has four tabs. Which are home, kids group, youth corner and contacts. During the planning it was also decided to provide more of graphics content than text.
2. The second step was putting content to the four main menu tabs. The home page was kept attractive with automatic slideshow of children photo. There is also an auto playing song video when the home page is opened. It is possible to pause the video is not desired to be viewed by the user. The other content in the home page is a link to the gallery. The gallery contains the educational materials produced. The gallery's pages are built as separate pages. The gallery is not directly visible from the main menu. The other pages which are kids group and youth corner pages were designed in a way to contain image buttons to show the available age group materials and direct the user to the gallery content page.
3. The third step of finishing was building the gallery pages. The most important thing put into consideration was giving access to the materials through different ways. For example: when a user goes to the bible stories located under the gallery, the user can go from one story to the other by going back to the gallery or using the next and back buttons.
4. The final step was putting audio-visual content into the gallery. All of the contents used were taken from the book and from the audio recordings. Color mode changing into RGB and document resizing was taken care of before putting the pictures and the audio reader narration.

### **Card game**

1. The first step in designing the card games was deciding the kind of play can engage children in the learning and social interaction with their peers. Memory game was chosen because children enjoy playing it and it can help them memorize the characters they see on the card and help as a fun way to revise what they learnt through the other mediums.

- The second step was deciding the size of the card. Using an international standard size A4 paper, I folded it in to small folds and one sixteenth of the page looked good size for the card.
- The third step is choosing which characters from which stories can be used on the card. The picture characters were chosen in a way to be able to be seen at once and be able to make the children think of a specific story. The other criteria was making sure the pictures are distinguishable from one another. Since it is memory game, if the picture characters are all similar, it would be difficult for the children to remember the difference.
- The final step was designing the cards back and forth side on Adobe Photoshop. And color codes were also added as a stroke border to mark as an identity. Sixteen cards were designed on one page. The cards were printed on a sticker and put on a thicker card board.

### Audio-Visual content

#### Audio

- The audio content was produced before the video content. The first step was deciding the content in order and writing the stories according to that order. All of the recorded audio is a narration of the book. That means there was no separate preparation of the content.
- The audio was recorded in public library studio. The quality of the studio's recording is very good. Vocal warm up and practicing reading the stories were part of the preparations made. It was important to make sure the tone of the voice was in the mood of storytelling and making sure the stories recording wouldn't sound as it is being read. Each story was recorded in separate tracks repeatedly. The volume level was adjusted in a way that it wouldn't be too low or that it wouldn't be too high and sound like a damaged sound. The sound was recorded as stereo audio. Using the logic pro software the tracks were then one by one bounced out and saved converting into Mp3 audio file. Loop classical were added later.



Figure 11: Logic Pro sound recording software used

## Video

1. The video was edited by combining the graphics content from the book and the audio narration recorded. The pages from the book were modified in size wise. A new Photoshop document with a preset dimension for film was chosen. The relative story and exercise was combined into a single page.

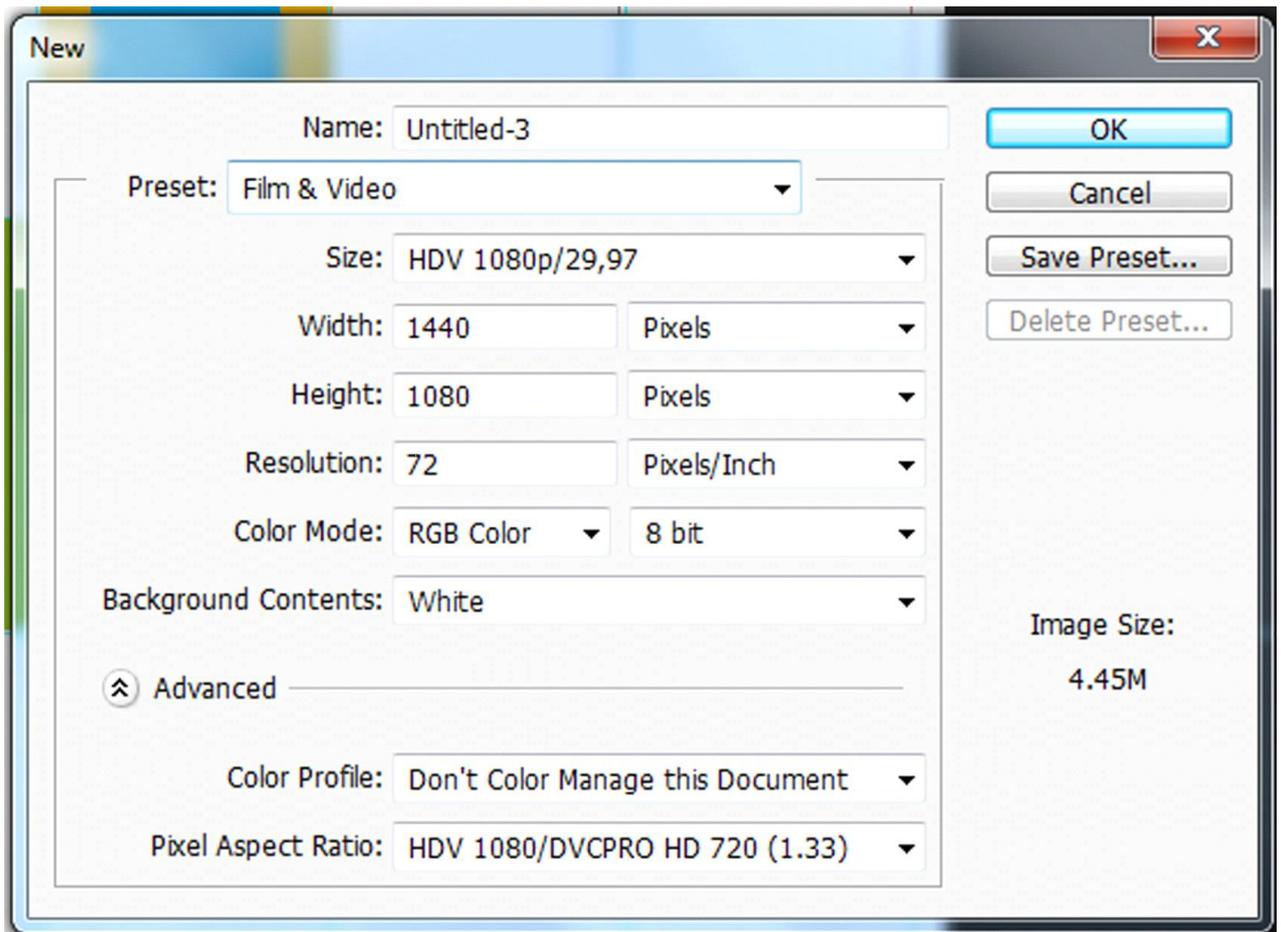


Figure 12: Dimensions for the video

The video produced for this project is not taken as a final product. But the aim of the videos is to be shared on social media networks such as YouTube and Facebook and promote the website and the book.

## 3.2 Data and Software used

The content data and the software used for each product is as shown in the table below.

	Product	Data Used	Software used
1	Book	Text, images and exercises	Adobe Photoshop
2	Website	Images, Songs	Wix
3	Card game	Images from the book	Adobe Photoshop
4	Audio	Written script from bible, Narrator	Logic Pro
5	Video	Images and Audio	Adobe Premier Pro

Table 1: data and software used

## 3.3 Test arrangement

Various tests were arranged during the project. The products were given to children in various occasion during informal product testing, to get the feedback from users. The social media is also one of the important means of getting feedback from the mass. The website and audio-visual content are already available on Facebook and YouTube which makes it possible for us to find out the user needs and feedbacks. The books were also printed for trial and given out to the local Ethiopian Church community. It has been used multiple times with the children.

### 3.3.1 Measure of success

Here are seven ways used to measure the success of the project.

**Budget:** In measuring the success of projects budge is one of the most important factors. It often restrains scheduling as well. Common questions considered in basing the success metrics on the project budget include if the project was completed on budget and availability of additional resources to fund?

Since, in the case of this project it was a zero budget, most of the metrics measurements add a negative effect in the success of the project. It is very hard and at times impossible to expect a successful output when the necessary inputs such as budget, fund are missing.

**Timing:** There are a number of questions to consider about project scheduling in deciding whether timely completion is one of the success metrics for the project. The completion deadline of the project was not very important. There are not any penalties or additional costs associated with scheduling delays. So there was flexibility in the overall schedule and with respect to certain milestones. There are not any other projects relying on this project being completed on time. Completing the project on time was not a priority but other aspects are more important such as quality, customer satisfaction and professional development.

One important measure of success relating to timing in this project is, to produce a quality product and satisfy customer it is essential to take enough time and do the work. Every time taken to do the work costs budget. So the investment of enough amount of time relates directly to investment of enough amount of budget.

**Scope:** Everything was completed within the agreed upon scope of work. There weren't any defined scope differentiate between "must do" and "do if possible". There weren't also penalties that apply if components of the project are not completed.

There was enough time in the schedule for change requests that expand the scope of the project. User tests were held multiple times and changes were made. There was not sufficient internal resources in respect to time and budget to deal with an expanded scope.

**Quality:** It's impossible to do the highest quality work, for the lowest price, in the shortest amount of time. That's why it is important to think about which success measures are most important for each project. If it is chosen to define the success of a project in terms of quality of work, it is important to be sure to establish metrics that are attainable given the scope, schedule and budget of the project and their relative importance.

**Client/Customer satisfaction:** Client satisfaction can be implemented through testing the product with users. Doing these customer feedback and testing is critical to the success of projects. Measuring the success of your project on the basis of client satisfaction is good practice. Unlike some other metrics, customer satisfaction ratings were measured throughout the project so that course corrections can be made. The customer satisfaction can be obtained through the user testing process.

**Project team satisfaction:** Another way the success of a project was measured is based on team satisfaction. If keeping a team engaged in challenging and satisfying projects is a priority, one may choose to measure the success of a project on that basis by including one or more team satisfaction metrics when you measure project success.

In the case of this project, it was more of individual work. In order to build a team the above mentioned keys such as budget matter.

**Personal and professional development:** Another way of measuring project success is based on the contribution the project makes to professional development of the project manager and other members of the team. In measuring the success of this project the following were found out:

- The project presented an opportunity for the production team to achieve one or more personal goals; such as increasing self-confidence, professional experience, setting out a product, forming a customer community and making new connections with organizations.
- The leadership skills I develop from running the project contributed to your professional development goals. It has helped me in the attainment of a project management skills.
- The project has offered opportunities for me to gain skills that will benefit me at work and in their careers.

### 3.3.2 Testing with target end users

The test methods used with the target end users were using the products. The products that were tested were the book, card board game and the website. Since the audio-visual content is accessible under the website, it was not important to run a separate test. Here are the steps taken in running the user test:-

User was handed with the book or card game or given access to website (depends on the product being tested)

The children were allowed to do what they want and observe their interest

1. Children were asked - if they understood what the story versus the exercise pages are
2. Interest of children to use the book was observed given a mark out of 10.
3. Children were shown how to go around the website and asked to go around the website by themselves- observe ease of use marked out of 10
4. Children were given the card games to play with - ease of knowing how to play Mark 0 - 10
5. Children and parents were asked - what do you like about the product?
6. Parents were asked- what changes would most improve the product?
7. Parents were asked - Do you know other similar products?
8. Parents were asked - What would make you want to use our product?
9. Parents were asked - How likely would you recommend our product? Mark 0 - 10
10. Parents were asked - How important is price when using this type of product? Mark 0-10

The above testing exercises were done with five children. The test results were as given in the table below.

	User Age	Test Questions									
		1	2	3	4	5	6	7	8	9	10
Child 1	5	👍	10	8	10	pictures	-	-	-	-	-
Child 2	4	👍	10	5	10	coloring	-	-	-	-	-
Child 3	7	👍	7	10	10	pictures	-	-	-	-	-
Child 4	7	👍	8	10	10	exercises	-	-	-	-	-
Child 5	9	👍	7	10	10	shortness	-	-	-	-	-
Parent 1	-	-	10	9	10	Simplicity	Parents' guide	👍	Quality	10	5
Parent 2	-	-	10	8	10	Clarity	Add songs	👍👎	Quality	10	4
Parent 3	-	-	10	10	10	illustration	Activity idea	👎	Quality & Price	10	5
Parent 4	-	-	10	10	10	Easy to use		👎	Quality	10	2
Parent 5	-	-	8	8	10	Sequence		👍	Quality & Price	10	5

Table 2: User test results

Some of the improvements made to the products based on the feedbacks collected during the user test include the following:-

- Teacher's activity guide was added for each lesson.
- The background of the lessons and exercises page was changed to white.
- The pages were made clearer.
- The audio recording originally was made with a male voice. After testing with the users it was changed to child narrator.
- According to our user test results, the targeted user group was more satisfied with video that involves children than graphics animation.

## 4. Results

The outcome of the project is satisfactory. Considering the success measurement factors such as time, budget, team members were missing, with the given amount of input the outcome was satisfactory to the clients. The different outcomes results published through different platforms looks as shown below.

### 4.1 Print - Book



Figure 13: Front and back cover pages



Figure 14: Inside pages

## 4.2 Video and Audio

The audio recording is used in two ways. One way is in the Dvd attached together with the book. The targeted users who are Ethiopian children living in Ethiopia have better access of DVD players. They can view the videos or listen to the narration through Dvd player devices.

The other way is in the website to narrate the stories. It functions as an audio book. This option is designed for Ethiopian children living abroad and in cities. They have better access of internet connection, which makes it easier for them to use the audio from the website.



Figure 15: DVD attached with the book

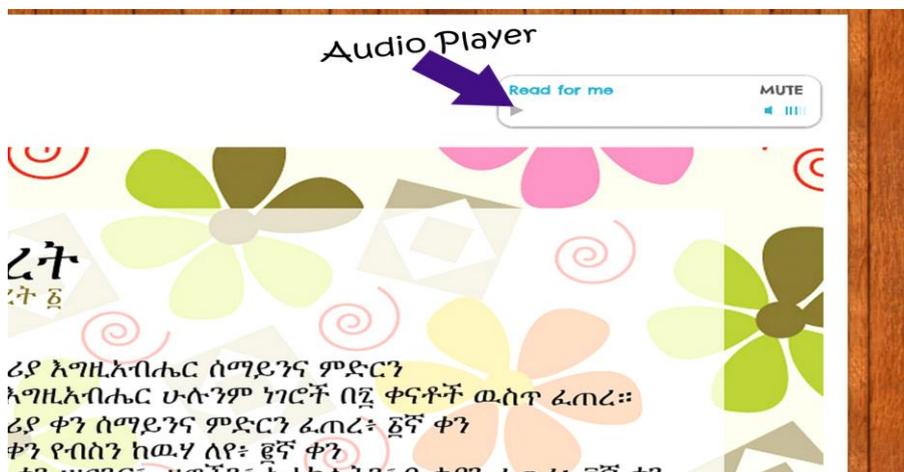


Figure 16: Audio player for the website

The video was uploaded in two ways. One is it was uploaded on YouTube to easily use for the website. The second upload was on Facebook for social media group. The main purpose of the videos on the social media is to create discussions, promote and direct users to the website.

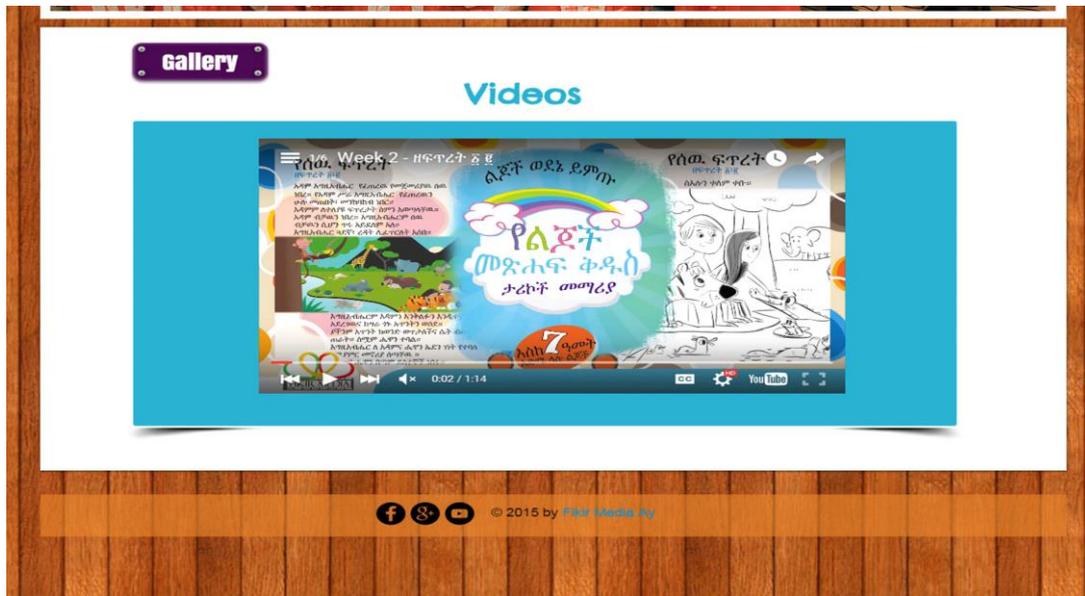


Figure 17: video in the website

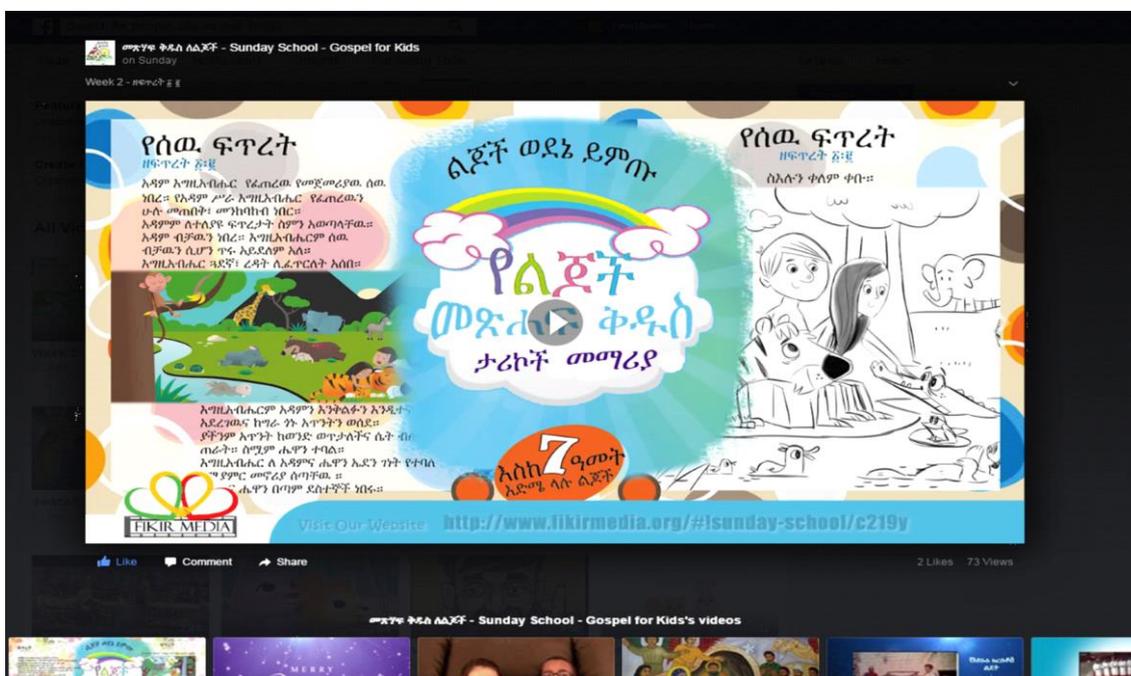


Figure 18: Video in social media page

## 4.3 Web

The outcome of the website was as desired. The main page of the website that contains all the materials is the gallery found under kids group. The page was kept as simple and clean as possible. Under the stories, when the images are clicked on, they direct to another page that contains the full page view with the read for me audio. The videos can be watched from the website or from YouTube. The exercises, when they are clicked expand to full page.



Figure 19: website gallery page

#### 4.1.4 Card board game



Figure 20: Card memory match game before cut

#### 4.2 Evaluation of success

The success of the project was measured according to the measurement criteria put. The table below shows the evaluation of the project.

No.	Metrics	Evaluation
1	Budget	No budget project, lack of budget affects quality and efficiency negatively
2	Time	Flexible schedule Milestones accomplished in time
3	Professional development	Great experience in project management, setting up network for the products

Table 3: Evaluation of success

### 4.3 Possibility of application

There are many possibilities for the application of the studies done through this project. As we are going ahead to a century of technological advancement, various types of devices, software applications and new media platforms emerge all the time. The life style of users has evolved from single device usage to multi device and multi-platform usage.

Children learn to use devices at early age. They have access to mobiles, tablets, books, sound toys, computers and television. The aim of this project is find out how we can decrease the negative effects of media usage on children and change it to the possibility of healthy use. Cross media can function as a balanced diet between different media platforms, it can help the user change between different platforms and using habits. The scope project can be expanded to be applied for different areas of formal and informal educational material production for children in any age. Designing an educational program can help the user learn better in a healthy manner. A mobile application can also be developed out of the website and card board game for future advancement of the project.

## 5. Conclusions

The experimental work performed in the project describes clearly that use of educational media for children can be published through cross media platforms. Using mixed publications through different platforms helps the children in healthy growth. The effect of appropriate educational programs published through use of cross media platforms can be used in an advantageous manner for the advancement of young children's cognitive and emotional development in a positive way.

Besides using educational materials, it is very important to encourage children to play independently when parents cannot actively play with their child, instead of turning on the TV, or giving a mobile phone it is important to let the child play alone, while they are nearby. Independent play enhances children to develop their imagination, increase their problem-solving abilities, and tasks accomplishment. Using educational programs published through different cross media platforms can help to read and play together. Researchers recommend that "unstructured playtime is more valuable for the developing brain than any electronic media exposure". Playing and reading together nurtures a child's cognitive and language development. The importance of interaction between child and caregiver cannot be understated [24].

Designing an age appropriate, quality content for children costs time, money and human resource. This kind of projects can benefit children in developing countries very much. Children need education to have a better future. Children need education to fight poverty in material psychological, social wise. Education is the most important demand, we need to work together to provide for children who do not have the privilege. If used properly, media is a very effective tool to educate children. Publishing content through cross media platforms helps in providing media content for children in a balanced healthy manner.

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