



# Multiple Intelligence: Learning with Interactive eGuide Book for Enhancing Young Children's Intrapersonal and Interpersonal Intelligences

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Received 16 Desember 2023 • Revised 7 February 2023 • Accepted 16 Maret 2023

## ABSTRACT

Young children aged 4 to 6 years old experience greater impact on their emotional and social development compared to adults during the lockdown period. The prolong absence from school confines their exposure to engage outdoor activities and learning activities with peers. Consequently, they tend to be clingier to their parents. Therefore, this study aims to develop intrapersonal and interpersonal intelligences among young children through the interactive eGuide book created in this study. The interactive eGuide book contains professionally selected learning activities which were carried out for four weeks with the facilitation of parents. The samples involved a total of 12 parents residing in Selangor, Malaysia who had given consent to participate in this study. The young children's reactions related to intrapersonal and interpersonal intelligences were observed and recorded. Semi-structured interviews were conducted to explore the children's development before and after utilising the interactive eGuide book. Thematic analysis was done to identify themes and subthemes. The findings were positive as there was a great intrapersonal and interpersonal improvement among the young children. They were able to regulate their emotions and build self-confidence; they were more expressive to communicate their feelings with others and demonstrated decision-making skills. The interactive eGuide book is proposed to also be used in normal situations especially by first-time parents and preschool teachers to develop children's intrapersonal and interpersonal intelligences so that they are able to analyse their strengths and weaknesses, work collaboratively and create worthwhile relationships since young.

**Keywords:** interactive eGuide book, learning activities, young children, intrapersonal, interpersonal

## INTRODUCTION

Multiple Intelligence (MI) Theory was introduced in the early 1980s by Howard Gardner through the book 'Frames of Mind'. 'Frames of Mind' was first published in 1983. It was then revised and re-published in 2011 for the celebration of 30th anniversary introduction with an extension of the theory [1]. In his theory of Multiple Intelligences, Howard Gardner sought to expand the field of human capabilities beyond the estimation of intelligence quotient (IQ). When working with young children of different ages, talents and backgrounds in his research, Howard Gardner realised if a child is good at one aspect, it does not necessarily mean the child is also good at all other aspects. More discoveries were collected when he worked with brain-damaged patients. Individuals who suffered from brain damage experience different disabilities depending on the location of the lesion. One

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brain-damaged patient might be strong in the particular area, while the other patient was weak in that area. In fact, each individual possesses varying levels of separate intelligence [2], and this represents individual distinct strengths and weaknesses. In the research of Howard Gardner [3], there were initially seven intelligences discovered. In 1999, two more new intelligences were added, and hence there are nine multiple intelligences. The description of each intelligence with the skills inherited is summarised in Table 1. With the ongoing research by Howard Gardner and his team, the list of multiple intelligences is expected to expand.

**Table 1.** The Nine Multiple Intelligences

No.	Intelligence	Skills
1.	<b>Verbal-Linguistic Intelligence</b> Well-developed verbal skills and sensitivity to sounds, meanings and rhythms of words	Listening, speaking, writing, teaching
2.	<b>Mathematical-Logical Intelligence</b> Ability to think conceptually and abstractly, and capacity to discern logical or numerical patterns	Problem-solving, performing experiments
3.	<b>Musical Intelligence</b> Ability to produce and appreciate rhythm, pitch and timber	Singing, playing instruments, composing music
4.	<b>Visual-Spatial Intelligence</b> Capacity to think in image and pictures, to visualize accurately and abstractly	Puzzle building, painting, constructing, fixing, designing objects
5.	<b>Bodily-Kinesthetic Intelligence</b> Ability to control one's body movements and to handle objects skilfully	Dancing, sports, hands-on experiments, acting
6.	<b>Interpersonal Intelligence</b> Capacity to detect and respond appropriately to the moods, motivations and desires of others	Seeing from other perspectives, empathy, counselling, co-operating
7.	<b>Intrapersonal Intelligence</b> Capacity to be self-aware and in tune with inner feelings, values, beliefs and thinking processes	Recognise one's strengths and weaknesses, reflective, aware of inner feelings
8.	<b>Naturalist Intelligence</b> Ability to recognise and categorise plants, animals and other objects in nature	Recognise one's connection to nature, apply science theory to life
9.	<b>Existential Intelligence</b> Sensitivity and capacity to tackle deep questions about human existence, such as the meaning of life, why do we die, how did we get here	Reflective and deep thinking, design abstract theories

(Anderson, 2004)

Gardner (1983) claimed that all humans have all intelligences but in varying degrees. Intelligence can be developed or weakened, ignored or strengthened with practice. In fact, students can experience greater success if learning tasks are directly related to their developed intelligence. However, under the formal education system, language and logical-mathematics are commonly emphasised when assessing a student's competence.

The COVID-19 pandemic has resulted in implementing various virus containment measures such as school closures, social distancing and home quarantine. As a consequence, children are experiencing a prolonged state of physical isolation from their peers, teachers, extended families, as well as community network. In adherence to the standard operating

procedures (SOPs), adults are permitted to go the office, shops and markets but children have been restricted to only stay at home for a period of more than three months since lockdown. After being disconnected physically from the outside world, are the young children really all right? Childhood is considered a sensitive period for brain systems to undergo socioemotional development. By isolating young children from interacting with others physically during the lockdown period, their developing brains are highly susceptible to excess worry and fear [4], [5], and [6]. Children's fears of catching the virus, compounded with social stressors, such as school closures, lifestyle changes, social isolation, caregiver stress, may adversely affect children's short term and long term mental health [4], [5], and [6].

In consideration of the urgent needs of young children's socioemotional growth especially during the lockdown period, an interactive eGuide book in this study was designed and developed to support young children's development of intrapersonal and interpersonal intelligences.

## **MATERIAL AND METHODS**

### **Methods**

The intervention, research design, sample and context, research procedures and data analysis are discussed in this section.

#### **Online Interactive eGuide Book Intervention**

To ensure the interactive eGuide book is scalable to meet greater needs in the future, the eGuide book in this study was designed and developed using Google slides so that relevant stakeholders may expand its contents without much technical expertise required. Google form was embedded for the participants to record their observation. There were 14 learning activities compiled with detailed lesson plan provided for each activity. The learning activities selected focusing on intrapersonal and interpersonal intelligences catered for young children aged 4 to 6 years old. For each learning activity, there was an avatar image integrated with the researcher's voice to explain the activity. For clearer demonstration, YouTube video for each learning activity is inserted. The interactive eGuide book is compatible with Mac, Windows, iOS, and Android, and hence it is accessible via smartphone, tablet, laptop and desktop. The contents have been validated by an early childhood expert who possesses more than 10 years' experience in early childhood education, from a kindergarten Principal to an academic in an open and distance learning university. Table 2 is the categorisation of the learning activities. Figures 1 and 2 are the examples of the interactive eGuide book in this study; while Figure 3 illustrates the examples of the learning activities.

**Table 2.** Categorisation of the Learning Activities

<b>Categories</b>	<b>Learning Activities</b>
Lego	1, 2
Read Aloud	3, 4, 8
Dance	5

Art and Craft	6, 7, 9, 12, 14
Treasure Hunt	11
Role Play	10, 13

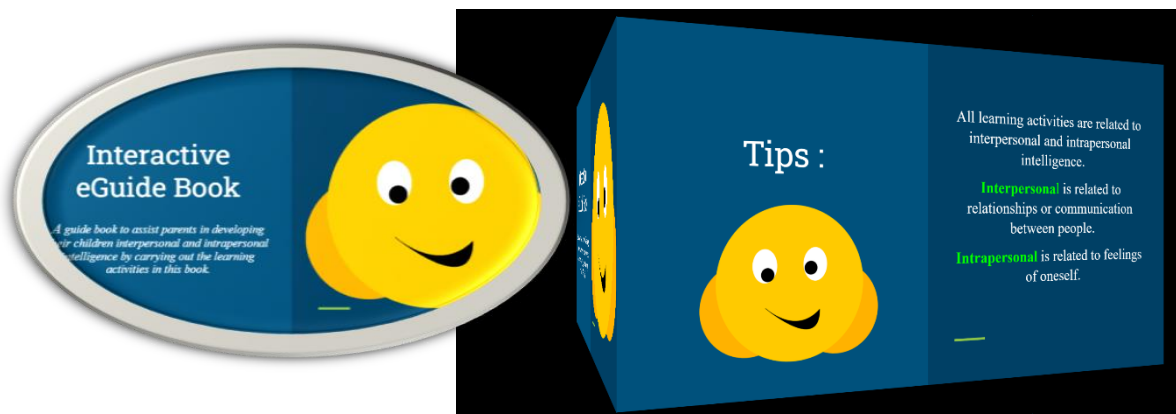


Figure 1. Interactive eGuide Book



Figure 2. Example of Lesson Plan in Interactive eGuide Book



Figure 3. Learning Activities

### Research Design

A qualitative descriptive design was employed in this study. Qualitative descriptive design has the inherent simplicity, flexibility and utility in diverse contexts. It is particularly relevant where information is required directly from those experiencing the phenomenon under investigation [7]. In this study, qualitative description helped elicit participants'

perspectives regarding the use of interactive eGuide book in facilitating the development of intrapersonal and interpersonal intelligences of young children aged 4 to 6 years old.

### **Sample, Context and Instrument**

Participants eligible for inclusion were parents with young children aged 4 to 6 years old who had no previous history of using the online interactive eGuide book. Purposive and snowball sampling strategies were used whereby eligible participants were asked to recommend parents they know to participate. Invitation emails with the researchers' contact details were sent. There were initially 17 participants recruited. Consent forms were given to obtain their permission to be involved in the study. The roles of the participants during the research process were explained. Participation was voluntary and participants were allowed to withdraw if they felt uncomfortable to proceed.

The participants in this study were parents residing in Selangor, Malaysia. All districts in Selangor had been categorised as red zones due to the high number of active COVID-19 cases [8]. A district in Malaysia that reported 41 local COVID-19 cases and above within the past 14 days were declared as a red zone, along with the implementation of stringent SOPs such as school closures and interstate or inter-district travel bans [9]. In addition to that, only two members from the same household were allowed to go out to buy groceries or medicines within 10km from the place of residence. Therefore, young children in this study had been confined at home for more than three months.

Participants who completed more than five learning activities with their children within four weeks proceeded with data collection via semi-structured interview. The same learning activity could be repeated depending on individual child's desire. The interviews in this study were conducted individually at the time convenient to the participants which generally covered the duration of 20 min. Semi-structured interview is an in-depth interview where the participants respond to predetermined but open-ended questions. To achieve optimum use of interview time, interview guides were prepared to ensure information was collected systematically and comprehensively as well as to keep the interview focused. Pilot study was conducted on the interview guides in order to have the interview data captured more effectively.

Initially, there were 17 participants recruited, however, there was one participant who met the criteria of completing at least five learning activities did not proceed with the interview due to busy schedule. Besides, there was also one participant who completed all the learning activities decided not to proceed with the interview due to personal reasons. There were three participants completed less than five learning activities and hence they were not eligible to proceed with the interview. Therefore, data collection was done with 12 participants.

### **Procedures**

The design and development of the online interactive eGuide book were done in February and April 2021. It was then sent to the expert to validate the contents. Revision and refinement were then carried out to improve the interactive eGuide book. Between 15 and 25 May 2021 pilot study was conducted with three parents who had children aged 6 years

old. Meanwhile, recruitment of participants was carried out, briefings were conducted and consent forms were distributed. The engagement with interactive eGuide book commenced from 30 May 2021 to 26 June 2021. Data were collected on 2 – 16 July 2021. The researchers contacted the participants for follow-up and arranged for data collection over the phone or via online platforms which deemed feasible for the participants. Table 3 outlines the procedures taken place.

**Table 3.** Procedures

Stages	Date
Design and development of interactive eGuide Book	February – April 2021
Content validation	3 – 10 May 2021
Refinement	11 – 14 May 2021
Pilot study (3 parents with children aged 6 years)	15 – 25 May 2021
Recruitment of participants, briefings, consent	1 – 25 May 2021
Commencement of learning activities	30 May 2021 – 26 June 2021
Semi-structured interviews	2 – 16 July 2021

### Data Analysis

Data were collected and analysed concurrently. For each individual interview, it was transcribed verbatim and data analysis was done using Braun and Clarke's [10] six-phased thematic analysis. In the first phase, the transcripts were read and re-read to become familiar with the data. The researchers' thoughts were also jotted down. Then, initial codes were generated. The process of recoding and new coding ended when the data were fully coded and the data relevant to each code had been collated. In the following phase, similar codes were gathered, collapsed and categorised into themes. The coded data were reviewed to identify areas of similarity and overlap between codes. Themes and subthemes were generated and constructed. The fourth phase involved a recursive process whereby the preliminary themes were reviewed in relation to the coded data and entire dataset. There were two themes discarded and one additional subtheme created during the revision. The fifth phase involved deep analytic work in defining the themes. Distinctive definition and narrative description of each theme were produced. The scope of what each theme entailed was clearly delimited to illustrate key features of the themes. The final phase involved writing up the final analysis and description of findings [10]. In fact, writing and analysis were thoroughly interwoven in this qualitative research from informal note-taking to more formal processes of analysis. Unlike quantitative method, writing analysis only begins after all the statistical analysis is completed. The data analysis was conducted by the first author and cross-checked by the second and last author to minimise errors and improve credibility. Along the process of data analysis, inconsistencies were discussed, then codes, themes and subthemes were refined.

## RESULTS AND DISCUSSION

### Participants' Characteristics

Participants' ages ranged between 30 and 45 years old. Among the participants, there were only three male and nine female. Most participants ( $n = 10$ ) were working full-time, while

two participants were working part-time. All participants reported having children aged between 4 and 6 years old which met the criteria set in this study. There were five participants indicated they spent time daily with their children for activities lasting between 15 min and 30 min. There were five participants mentioned they only spent time with their children on weekends for activities, and there were two participants reported they rarely spent time with their children for activities due to tight work schedule. Table 4 presents the participants' characteristics

**Table 4.** Participants' Characteristics (n = 12)

Characteristics	n (%)
Age (years)	
Range	30-45
Gender	
Female	9 (75)
Male	3 (25)
Employment	
Working full-time	10 (83.3)
Working part-time	2 (16.7)
Possess kid aged 4-6 years	
Yes	12 (100)
No	0 (0)
Frequency of spending time with children for activities before using interactive eGuide Book	
Daily	5
Only on weekends	5
Rarely (around once fortnightly)	2

## Findings

Findings from individual interviews are presented under four overarching themes: development of intrapersonal intelligence, development of interpersonal intelligence, features of interactive eGuide book and overall impression of interactive eGuide book. Table 5 details the themes, subthemes and sample codes.

**Table 5.** Themes, subthemes and sample codes

Themes	Subthemes	Sample Codes
Development of intrapersonal intelligence	Self-expression	<ul style="list-style-type: none"> <li>• Like to express feelings, thoughts and ideas</li> <li>• Express feelings, thoughts and ideas in some activities</li> <li>• Not really like to express feelings, thoughts and ideas</li> </ul>
	Self-confidence	<ul style="list-style-type: none"> <li>• Trust his/her skills in carrying out the activities</li> <li>• Demonstrate motivation to try</li> <li>• Reluctant to carry out the activities</li> </ul>

Themes	Subthemes	Sample Codes
	Managing emotions	<ul style="list-style-type: none"> <li>• Know when and how to express emotions</li> <li>• Showing efforts to control emotions</li> <li>• Easily lose control</li> </ul>
Development of interpersonal intelligence	Bonding	<ul style="list-style-type: none"> <li>• Closer with each other</li> <li>• Attention is switched to carrying out activities together</li> <li>• Always looking forward to the activity time</li> </ul>
	Leadership	<ul style="list-style-type: none"> <li>• Tend to show how the activities should be done</li> <li>• Will help to explain how the activities are to be done when parents are unsure</li> <li>• Waiting for instructions</li> </ul>
	Problem-solving	<ul style="list-style-type: none"> <li>• Able to suggest alternatives when certain materials are unavailable</li> <li>• Tend to skip the activities when the materials suggested are unavailable</li> <li>• Show anger when activities are not understood</li> </ul>
Features of interactive eGuide Book	Development of intrapersonal intelligence	<ul style="list-style-type: none"> <li>• Interesting videos that engage children</li> <li>• Able to pause the videos for re-thinking</li> <li>• Instructions given are clear and systematic</li> </ul>
	Development of interpersonal intelligence	<ul style="list-style-type: none"> <li>• Collaborative activities that foster bonding</li> <li>• Well-rounded activities that cover various aspects</li> <li>• Avatar character with voice stimulates interaction</li> </ul>
Overall impression on interactive eGuide Book	Duration	<ul style="list-style-type: none"> <li>• 4 weeks is sufficient</li> <li>• Extra 1-2 weeks will be good due to heavy workload during lockdown period</li> <li>• More time to be given as children need repetitive learning on activities</li> </ul>
	Suggested improvement	<ul style="list-style-type: none"> <li>• Good enough to follow and understand</li> <li>• To add more drawing and colouring, singing; reduce the read aloud as children could not sit still</li> <li>• To have more upbeat themes for dancing learning activities</li> </ul>

### Theme 1: Development of Intrapersonal Intelligence

Participants observed that their children were more ready to reflect upon their feelings and share their thoughts after the process of engaging interactive eGuide book.

#### Subtheme: Self-Expression

"I was always rushing for the daily routine activities like bathing, tuck him to bed and eating food. These learning activities expose my child and me the activities we enjoy. And, he tells me more about his ideas now." (Parent 10)

The learning activities nurtured their confidence through trial and error.

#### Subtheme: Self-Confidence

"The lego activity ... it was not easy for my daughter to build. She kept trying and finally made it. She was so happy and asked me to snap pictures." (Parent 1)

Children displayed improvement in trying to manage their emotions through the read aloud activities.

#### Subtheme: Managing Emotions

"My daughter was like impatient when the story 'We're going on a bear hunt' went a little bit longer. But, the cute actions of the man slowly attracted her and she followed till the end. And, now she still keeps repeating the actions of the story ..." (Parent 12)

### Theme 2: Development of Interpersonal Intelligence

The learning activities created space for parent-child bonding.

#### Subtheme: Bonding



"My child always asking for activities in the eGuide book. The activities normally done in weekends and sometimes weekdays after working hours. It does serve as great bonding time for us. We used to busy with routine activities." (Parent 10)

Several participants expressed their children were more inclined to explain the activities to them as the activities were in children context and they could understand more easily.

**Subtheme: Leadership**

"... I was confused with the dance steps. My daughter showed me how to remember the steps." (Parent 7)

Children displayed creativity in solving problem when dealing with the learning activities.

**Subtheme: Problem-solving**

"We do not have lego, so it was not easy to build numbers. My son took out his plasticine to play the game." (Parent 2)

**Theme 3: Features of Interactive eGuide Book**

The features of the interactive eGuide book such as embedded avatar image and videos helped relate the learning activities to children's context.

**Subtheme: Development of Intrapersonal Intelligence**

"We could pause the videos according to our pace. And, this gave us some room to re-think the activities. The expectation of each activity was voiced by the avatar and this made us understand what we could achieve." (Parent 4)

The learning activities were to be carried out with parents and hence interaction was reinforced.

**Subtheme: Development of Interpersonal Intelligence**

"The activities need the parent to be around and do together with my girl. So, it sort of pushing me to spend more time with her than on phone." (Parent 9)

**Theme 4: Overall Impression of Interactive eGuide Book**

The duration of 4 weeks was appropriate under normal situation with consistent slots. However, additional time was needed in this period of uncertainty.

**Subtheme: Duration**

"In normal conditions, 4 weeks is sufficient. Under the extended and ever changing MCOs and the extra stress it brings, it might work better with more time given." (Parent 3)

Due to long hours of online learning implemented during the lockdown period, parents preferred to reduce screen time for their children as the interactive eGuide book was hosted online.

**Subtheme: Suggested Improvement**

"I hope we can use books instead of videos to better engage with kids. They will have more eye contact with parents and will love books more instead of getting addicted with screen." (Parent 6)

From the perspective of intrapersonal intelligence, the participants saw the growth of their young children's analytic skills as they seemed to be aware of their own strengths and weaknesses. For example, several children used counting to help them remember the steps in building LEGO animals, while some drew the animals with LEGO blocks so that they could remember the number of blocks needed. The children are able to reflect upon appropriate methods that suit their styles. There are also seven children demonstrated self-motivation and self-discipline as they would remind their parents about the sessions of interactive eGuide book and got the devices ready. There were seven participants believed that their young children had improved in managing their emotions with the engagement of the learning activities of the interactive eGuide book. The children's minds and bodies were so engaged with healthy and meaningful activities till the negative emotions were dispelled [11].

Findings highlight all the 12 participants agreed that the bonding with their young children had improved with the engagement of interactive eGuide book, and the development of their young children's interpersonal intelligence was observed. The young children were more empathetic and were able to understand their parents' emotions and expectations compared to the previous time. In addition, they enjoyed being around with others. The young children also demonstrated leadership skills and creativity to solve

problems during the learning activities which were not obviously seen in the past. All the 12 parents agreed that the interactive eGuide book had benefited their young children in the development of intrapersonal and interpersonal intelligences and highly recommend it to other parents.

The design and development of interactive eGuide book was created for intrapersonal and interpersonal intelligences that met young children's learning environments and modes. The avatar image triggers children's curiosity in fostering improved learner engagement, focus, trust, and retention [12]. It helps to increase the sense of co-presence and encourage young children who are typically reluctant to speak up in real life feel more comfortable speaking and participating. The avatar image facilitates virtual social interactions. The videos enable children to progress according to their styles and pace. For instance, some children liked to forward the video in faster speed to understand the entire activity, then only rewind part by part to watch the details. The engaging contents were relevant to the needs and contexts of the children. For example, the read aloud activity (Learning Activity 8) 'Why we stay home: Suzie learns about coronavirus' was the favourite among the other two read aloud activities (Learning Activities 3 and 4) as it created awareness on the current COVID-19 pandemic. Young children were curious and eager to know more about the story, and thus establishing verbal and non-verbal communication as well as decision making skills to follow SOPs in order to keep themselves safe. The colours used were vibrant and able to attract children's attention. The compatibility of the interactive eGuide book in various devices increases the joy and fun as no technical difficulties or errors encountered.

Time constraint is one of the biggest challenges faced when using the interactive eGuide book. Apart from the tight daily schedules, participants had to spend time to prepare the materials required and go through the instructions before carrying out the activities. Besides, screen time is another worry. With the long duration of online education during the lockdown period, the use of interactive eGuide book had undoubtedly increased the screen time. The research by Mineshita et al. [13] identified a significant association between screen time duration and obesity, physical activity, and academic performance. A longer screen time may lead to obesity, decreased physical activity, and decreased academic performance. Therefore, other alternatives of presenting the eGuide book may need to explore.

Limitations relate to the small sample size and the descriptive methodology used. It must be acknowledged that the current study was exploratory in nature attempting to explore participants' perspectives of using interactive eGuide Book for the development of intrapersonal and interpersonal intelligences among young children. Notwithstanding these limitations, this study offers valuable insights into parents' perspective of the application of interactive eGuide Book at practical level.

## CONCLUSIONS

Home quarantine and social isolation are implemented to contain the spread of the virus and the overload of health systems. However, the impact of this long-lasting social isolation on children is still not properly addressed. The social touch is essential to develop cognition, emotions, attachment and relationships (Cascio et al., 2019). Almost half of all social mental disorders have their origins traced back to childhood (Kessler et al., 2005). The social mental

disorders will cause complications in intrapersonal and interpersonal intelligences. The interactive eGuide book in this study is the effort to mitigate the complications by offering support for intrapersonal and interpersonal development.

The interactive eGuide book is designed and developed with the initial aspiration to make it scalable so that its usage could be expanded. To further extend its usage to benefit larger community, the recommendation for future research includes reducing repetitive learning activities, reconstructing timeline, increasing sample size, catering to the needs of special education and developing thematic based interactive eGuide book.

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