Print-based storybook in the mother tongue for teaching COVID-19 prevention in the Philippines

Arvin Kim Arnilla

Aklan State University, Teacher Education Center, Makato 5611, Aklan, Philippines

https://orcid.org/0000-0003-3141-2043

Suggested Citation:
https://doi.org/10.18844/cjes.v17i8.7381

Received from May 12, 2022; revised from July 15, 2022; accepted from August 12, 2022.

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Abstract

The literature has shown that storybooks are helpful resources to teach young children about significant health, safety, and nutrition issues. The current project sought to produce a storybook about COVID-19 prevention written in the mother tongue (Akeanon) for young children using the Analysis-Design-Development-Implementation-Evaluation (ADDIE) model as a guide. In general, the mother tongue-based storybook is highly accepted by evaluators as they grasped the most significant intent in producing the resource, which is to instil staying at home to break the transmission of the virus and observe hygienic practices, primarily handwashing with soap and water. Additional information on COVID-19 signs and symptoms was also recommended to maximise its effectiveness for health teaching. While health literacy materials in English are welcome in the Philippines, the results of this project confirm that mother tongue-based instructional materials for COVID-19 are highly accepted, especially when validated resources are deemed helpful to raise awareness and encourage appropriate attitude and behaviour towards its prevention.

Keywords: ADDIE Model, COVID-19 prevention, instructional material, mother tongue, storybook

* ADDRESS FOR CORRESPONDENCE: Arvin Kim Arnilla, Aklan State University, Makato 5611, Philippines
E-mail address: arnilla_kim@yahoo.com / Tel.: +63-36-272-3923
1. Introduction

Producing health literacy material in the mother tongue for the use of healthcare workers, teachers of young children and parents of young children is essential to contribute additional validated resource material in the fight against the COVID-19 pandemic within the realm of information dissemination, and hopefully, elicit the appropriate health-seeking behaviour. This may also include exposing and educating young children (aged 3–6 years old) on the aspects of health and educational psychology with a child-friendly concept (Maziah et al., 2015). Encouraging children to take ownership of their health and hygiene behaviours, such as handwashing, will help to normalise this and prevent the spread of infection (Syeda et al., 2021).

When the coronavirus was first discovered in Wuhan, China, in December 2019 and was declared a full-blown pandemic by March 2020 (Mohan & Vinod, 2020), research about its nature, transmissibility and corresponding precautions unfolded gradually through mass media. The need to amplify the message of coronavirus prevention was seen in publications of leading health protection agencies such as the World Health Organisation (Bender, 2020) and the U.S. Centre for Disease Control (2020).

In the Philippines, there were health literacy materials for young children in the form of storybooks, tackling the nature of the virus, physical distancing and wearing of face masks, as well as tributes to frontline healthcare workers (Del Rosario, 2020a, 2020b; Evasco, 2020b, 2020a), all written in Filipino – the national lingua franca.

As clarified in previous studies, the use of the mother tongue in the development of literacy material benefits young children. For instance, Awopetu (2016) pointed out that young children learn better in their first language, while Hanson et al. (2021) emphasised the rich verbal interactions between parents and toddlers during storybook reading. Dulay et al. (2018) expounded that home literacy resources for Filipino children’s language and literacy were associated with vocabulary skills among 5-year olds. Also, Arnilla (2020) found that the use of mother tongue is one way of producing culturally relevant instructional materials.

Thus, following the analysis–design–development–implementation–evaluation (ADDIE) model, this study aimed to produce a storybook on COVID-19 prevention narrated in Akeanon/Aklanon, a mother tongue spoken in the northern portion of Panay Island in Central Philippines (Rubino, 2006).

1.1. Conceptual framework

1.1.1. ADDIE model

The ADDIE model comprises five phases, such as ADDIE (Molenda, 2003). The analysis defines the problem, identifies its source and determines possible solutions. It may also include specific research techniques such as needs analysis, job analysis and task analysis. The output of this stage often consists of the instructional goals and a list of tasks to be instructed. In this study, the phase is characterised as follows: 1) identifying the need for instructional material for young children; 2) focusing the message on COVID-19 prevention strategies, such as staying at home and frequent handwashing; and 3) using the mother tongue (Akeanon).

Design, on the other hand, involves using the results from the analysis stage to plan a strategy for developing the instruction. At this stage, one must outline how to reach the instructional goals determined during the analysis stage and expand the instructional foundation. The storyline supports the message of COVID-19 prevention, while the book format makes the dissemination possible, especially in places where Internet connectivity is a challenge.

The development stage produces lesson plans and lesson material. For this study, two prototypes were created using the readily available software for the illustrations and layout.

Implementation represents the actual delivery of the instruction. The purpose of this stage is the effective and efficient delivery of instruction. This phase takes places through online and offline means. A digital copy of the Prototype No. 1 was published on the official social media account of the campus, while Prototype No. 2 made use of printed copies for distribution.
Evaluation, as the final stage, accounts for the effectiveness and efficiency of instruction. This was accomplished through surveys and written comments by the evaluators.

1.1.2. ADDIE model in developing storybooks

Mitschek et al. (2017) used ADDIE to develop an interactive storybook application designed for children in the Philippines and abroad. Bakar et al. (2013) also used the model to create an interactive storybook focusing on vocabulary, assisting children in identifying vocabulary by giving them graphics to imagine, recognising multimedia elements and conducting effectiveness testing on an interactive storybook. Moradmand et al. (2014) explored the use of children’s literature for teaching mathematics through a computer-based multimedia application. Lesmono et al. (2018) validated Andro-web comics on work and energy topics which could serve as an alternative instructional material for teachers to draw the attention of students and help them in their lessons by providing interesting illustrations with simple language. Fatmah et al. (2020) developed a picture book on the growing character of a caring environment in primary schools.

1.2. Related research

Stories and storytelling convey information that engages readers, validates their experiences, and facilitates new learning (Lasiuk et al., 2018). Apart from this, a storybook is a scalable strategy (Grummon et al., 2022), a practical method (Bellows et al., 2013), with minimal cost and inconvenience (Burke et al., 2004) in influencing parents to adopt healthier options for their children.

Reports have shown that healthcare professionals have used children’s stories for therapeutic purposes, precluding harmful behaviours and addictions or dealing with psychosomatic disorders (Pulimeno et al., 2020). It has been used to change health behaviours related to human immunodeficiency virus (HIV) status (Edwards et al., 2020; Kalembo et al., 2019); overweight and disability (Harrison et al., 2016); eating and physical activity behaviours (Bellows et al., 2013); early childhood nutrition and parenting intervention (Agustina et al., 2018); avoidance of contaminated objects (Conrad et al., 2020); mental state references (Farkas et al., 2020); self-awareness (Rahimah & Izzaty, 2018); culturally valued qualities and behaviours related to achievement (Suprawati et al., 2014); formation of identities (Watson et al., 2015); disasters (Damayanti et al., 2020); and even road safety (Ahmad et al., 2018).

Hartling et al. (2010) identified the challenges in making stories which include keeping the authenticity of the story against being evidence-based, addressing consumers’ use of the web as the source of health information and striking a balance between being concise, comprehensive and widely applicable, taking into account story length, reading level, narrative mode, depiction of various demographics and exposures to the disease, illustrations and layout.

1.3. Purpose of the study

Storybooks are portable teaching materials for health literacy and behaviour. With the active participation of parents or caregivers, storybooks focused on health literacy could fill in the information gaps, particularly among young children. During the most critical period when the raging COVID-19 pandemic caused tremendous disruption across the broad spectrum of social life, the production of instructional material aimed to inform people, particularly young children, about the appropriate behaviour to prevent contracting the novel coronavirus, resulting in sickness and possibly death becomes an imperative. Hence, this research and development project aimed to produce a storybook in the mother tongue teaching young children about the importance of handwashing and staying at home.

The study was undertaken with the following end in mind:

1. describe the phases of Analysis, Design, Development, and Implementation
2. describe the evaluation of the storybook

2. Method and materials

2.1. Research method
This research and development project used the ADDIE model (Molenda, 2003). This is reflected as a framework in the Results and Discussion section (Figure 1).

![Figure 1: Phases of Production Following the ADDIE Model](image)

### 2.2. Evaluators

Employing the snowball sampling, the evaluators came from 15 of the 17 towns of the province of Aklan; all spoke Akeanon as their mother tongue. They were told that participation in the study is purely voluntary. Table 1 presents the demographic profile.

<table>
<thead>
<tr>
<th>Evaluator</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20–35 years old</td>
<td>78</td>
<td>60.5</td>
</tr>
<tr>
<td>36–51 years old</td>
<td>40</td>
<td>31</td>
</tr>
<tr>
<td>52–68 years old</td>
<td>11</td>
<td>8.5</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>19</td>
<td>14.7</td>
</tr>
<tr>
<td>Female</td>
<td>108</td>
<td>83.7</td>
</tr>
<tr>
<td>LGBTQ</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>Civil status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>37</td>
<td>29</td>
</tr>
<tr>
<td>Married</td>
<td>89</td>
<td>69</td>
</tr>
<tr>
<td>Widow/widower</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthcare workers</td>
<td>43</td>
<td>33.3</td>
</tr>
<tr>
<td>Teachers of young children</td>
<td>36</td>
<td>27.9</td>
</tr>
<tr>
<td>Parents of young children</td>
<td>50</td>
<td>38.8</td>
</tr>
</tbody>
</table>

### 2.3. Data collection tools

The survey questionnaire has three parts. The first part focuses on the demographics of the evaluators.

The second part contains six items asking the evaluators how they feel about the storybook. The items derived from the study by Kalembo et al. (2019) were modified and reordered to fit the intent of this research. For each item, the evaluators responded on a 5-point Likert scale in the range of 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree. Table 2 presents the comparison.
Table 2
Comparison of Original Items and Modified Items

<table>
<thead>
<tr>
<th>Original item</th>
<th>Modified item</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is a good idea to develop the resource.</td>
<td>It is a good idea that a storybook on COVID-19 in Akeanon was developed.</td>
</tr>
<tr>
<td>I will use the resource if developed.</td>
<td>I will use the storybook in teaching about COVID-19.</td>
</tr>
<tr>
<td>The resource will improve my confidence in the disclosure of HIV.</td>
<td>The storybook will improve my confidence in discussing COVID-19 with Akeanon children.</td>
</tr>
<tr>
<td>The resource will reduce my worries about how to disclose HIV to children.</td>
<td>The storybook will reduce my worries about how to present COVID-19 to Akeanon children.</td>
</tr>
<tr>
<td>The resource will improve my knowledge of HIV disclosure.</td>
<td>The storybook will improve understanding of COVID-19 prevention among children.</td>
</tr>
</tbody>
</table>

The last part is a prompt statement encouraging the evaluators to make comments on the storybook (‘Comment about the storybook, if any’).

The questionnaire was shown to three university-level instructors of research, statistics and early childhood education for face validation and then was pre-tested by three evaluators to observe issues that might arise during the actual data-gathering. All observations were considered in the revisions of the questionnaire. Thirty evaluators (10 health professionals, 11 teachers of young children and 9 parents of young children) from the pilot test were not included in the final data-gathering stage. Cronbach’s alpha value of 87 was obtained, which supported the good internal consistency of the items.

2.4. Data collection process

A total of 129 responses were collected consisting of 104 filled-out questionnaires and 25 responses on Google Forms.

2.5. Data analysis

All responses were anonymised before analysis. The evaluators’ demographic data and survey responses were processed through Statistical Packages for the Social Sciences.

The written comments were encoded, sorted and analysed using Quirkos, a qualitative data analysis software. The small amount of qualitative data for this study warranted the analyses to be carried out solely by the researcher using a combination of inductive coding strategy and content analysis, a process described by Decorte et al. (2019). Direct quotations cited in the study are marked by page numbers to identify their appearance on the printed Quirkos report and placed in italics. All comments except for one were written in English, thus requiring no translation.

For the rigour and trustworthiness of the analysis, member checking was performed (Candela, 2019; Creswell, 2014). Two evaluators were shown the results, and both of them agreed with the interpretations made by the researcher.

3. Results

This section presents the phases of production based on the ADDIE model.

3.1. Description of the ADDIE stages

3.2. Analysis

In the Philippines, healthcare authorities and academic institutions have warned Filipinos about the devastating effect of COVID-19 on individual and collective safety and well-being. Among
the genres utilised to convey these warnings to young children were storybooks published during the community quarantine period (Del Rosario, 2020b, 2020a; Evasco, 2020a, 2020b). It is unknown whether these publications were subjected to evaluation before release.

### 3.3. Design

#### 3.3.1. Storyline

A family of four, composed of the father, mother, son and daughter, lived in a rural village when COVID-19 struck. One day, while the children were playing outside the house, their mother called them inside because of an enemy of the community. Fearfully, they all went back to the house. After a while, their father hurried home and was in pain because his hands were stung by the enemy. To get rid of the pain, the mother advised the father to wash his hands with soap and running water while singing ‘Happy Birthday’ twice. The father was relieved. Anxiety engulfed the family as they observed the horrors caused by the enemy. They stayed inside the house to keep themselves safe. To while away the time, they sang and played.

#### 3.3.2. Format

The output is an eight-page full colour and printed on book paper. The printed book format would allow young children and their parents or caregivers to access health information contained in the storybook without the need for gadgets and the Internet. The choice also reflects the low Internet connectivity in the community.

#### 3.3.3. Development

Taking a cue from the publication of Bender (2020) for the WHO, the storybook focused on two strategies to prevent virus transmission: 1) staying at home and 2) handwashing with soap and water. Prototype No. 1, entitled ‘Ro COVID nga Nagapang-angkit’ (The Biting COVID), was completed in April 2020 using Adobe Illustrator for the illustrations, while the layout was completed in Microsoft Publisher. Few printed copies were shown to schoolteachers and a registered nurse for feedback. Prototype No. 2 under the revised title ‘Ro COVID nga Mapanghalit (The Harmful COVID)’ was released in December 2020. Procreate on iPad was used for the illustrations and Adobe InDesign for the layout.

#### 3.3.4. Implementation

The distribution of printed copies of Prototype No. 1 to selected villages was facilitated through checkpoints manned by village guards. They were requested to take the printed copies and disinfect them before giving them to households on their way home. When the lockdown was relaxed, face-to-face storytelling sessions with selected preschool children residing in the adopted community of the university were conducted (Figure 3). Feedback was collected to improve the output.

![Figure 2](image_url)
3.4. Evaluation

The evaluation came in twofold, acceptability and written comments, by the intended users.

3.4.1. Evaluators’ acceptability of the storybook

The evaluators were asked to rate ‘It is a good idea that a storybook on COVID-19 in Akeanon was developed’ and it was revealed that 93 (72%) evaluators chose ‘strongly agree’, 33 (26%) chose ‘agree’ and 3 (2%) chose ‘neutral’. The rating is well substantiated in the written comments of the evaluators. For instance, an evaluator had this to say, ‘I can say that this storybook will positively help explain effectively what COVID-19 is in a dialect that the children here in our province will be able to understand’ (page 4).

When asked to rate ‘The storybook will improve understanding of COVID-19 prevention among Akeanon children’, 91 (71%) evaluators rated it as ‘strongly agree’, 36 (28%) as ‘agree’ and 2 (2%) as ‘neutral’.

For the item ‘The storybook will improve Akeanon children’s knowledge about COVID-19’, 85 (67%) evaluators rated it as ‘strongly agree’, 42 (32%) as ‘agree’ and 1 (1%) as ‘neutral’. The said e-storybook was found to be a useful tool for providing support to children with autism, has helped them understand their feelings and assisted them in taking ownership of their health and hygiene practices.

When asked to rate ‘The storybook will improve my confidence in discussing COVID-19 with Akeanon children’, the responses distributed are as follows: 88 (68%) as ‘strongly agree’, 39 (30.23%) as agree’ and 2 (2%) as ‘neutral’.

When asked to rate ‘The storybook will reduce my worries on how to present COVID-19 to Akeanon children’, the responses distributed are as follows: 83 (64%) rated ‘strongly agree’, 44 (34%) as ‘agree’ and 2 (2%) as ‘neutral’.

Lastly, when asked to rate ‘I will use the storybook in teaching about COVID-19’, the subsequent distribution of responses was recorded as follows: 85 (66%) as ‘strongly agree’, 38 (29%) as ‘agree’ and 6 (5%) as ‘neutral’. The results of the acceptability survey are shown in Figure 4.
3.4.2. Comments on the storybook

In Part III of the questionnaire, freeform responses accounted for 59 codes and were categorised under 6 quirk titles. Two themes were generated, namely 1) Appreciation of the storybook in the mother tongue and 2) Insights on further improving the storybook. The quirk summary is shown in Table 3.

### Table 3

<table>
<thead>
<tr>
<th>Quirk title</th>
<th>Description</th>
<th>Codes</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appreciation – Overall impression</td>
<td>Appreciation for coming up with the storybook, its content and its impact</td>
<td>29</td>
<td>Appreciation of the storybook in the mother tongue</td>
</tr>
<tr>
<td>Appreciation – Form</td>
<td>Appreciation related to form (i.e., font, colour scheme)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Suggestions – Story</td>
<td>Suggestions (i.e., plot, settings, characters)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Suggestions – Form</td>
<td>Suggestions (i.e., font, colour scheme)</td>
<td>9</td>
<td>Insights on further improving the storybook</td>
</tr>
<tr>
<td>Suggestions – COVID-19</td>
<td>Suggestion (i.e., additional info on COVID-19)</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Suggestions – Language</td>
<td>Suggestions (i.e., structure, word choice)</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

3.4.2.1. Theme No. 1: Appreciation of the storybook in the mother tongue. Generally, the evaluators strongly agreed on coming up with a mother tongue-based resource (Akeanon in particular) on COVID-19 because of its usefulness on several counts. Taking a cue from Lasiuk et al. (2018) where stories and storytelling engage readers and validate their experience, an evaluator reported that, ‘Creating this book against COVID-19 is helpful for healthcare professionals, teachers, especially parents to make children understand the pandemic. It also
addresses both the emotions children may be feeling as well as provides useful information about the virus. Overall, the book is informative and useful (page 1).

Evaluators also focused on its function as instructional material to be engaged by both parents and children, with the former telling the story and the latter listening. Parent-led health education in the home had a positive impact in eliciting the appropriate health attitude and behaviour. One evaluator recounted that ‘The storybook is a really big help to all parents and other stakeholders who want to educate young Aklanon regarding COVID-19’ (page 3). Another evaluator echoed a similar observation: ‘The storybook was well presented, organised, and localised. It could be used as a reference and instructional supplement’ (page 2).

An evaluator noticed the entertainment the storybook could provide to young children while presenting the essential information about the novel coronavirus. She shared, ‘the storybook indicates the cause and effect of this worldwide pandemic in everyday means of every individual. It presents and visualises all necessary information about COVID-19 creatively that provides entertainment and awareness to the certain reader’ (page 3).

3.4.2.2. Theme No. 2: Insights on further improving the storybook. The majority of the participants are satisfied with the information on COVID-19 prevention contained in the storybook. One parent had this to say, ‘The story tells us how to avoid COVID-19 by staying at home for safety and handwashing as prevention’ (page 2). Another teacher reported that, ‘the storybook taught us to be wary of how dangerous COVID-19 is’ (page 4).

Participants, particularly the healthcare workers, expressed views of including issues like ‘mode of transmissibility’ and ‘control of transmissibility’ (page 7). Other parent-participants also suggested the inclusion of other signs and symptoms like ‘loss of smell and taste’, use of alcohol apart from soap and wearing of a face mask or face shield.

4. Discussion

Effecting health behaviour change through acceptable instructional material like a storybook was a topic of previous studies (Agustina et al., 2018; Conrad et al., 2020; Edwards et al., 2020; Harrison et al., 2016; Kalembo et al., 2019; Pulimeno et al., 2020). Particularly, the works of Kalembo et al. (2019) and Edwards et al. (2020) highlighted the significance of using the mother tongue in producing health literacy material.

In this study, the evaluation of the storybook as regards improvement of knowledge and understanding of COVID-19 among Akeanon children confirms the reports of Agustina et al. (2018), on the improved understanding and awareness of early childhood dietary habits and social behaviour, and Syeda et al. (2021), on helping children understand their feelings and assisting them in taking ownership of their health and hygiene practices.

The storybook as a shared instructional material between parents and their children will help improve the former’s confidence in discussing COVID-19 with the latter at home (Bellows et al., 2013). As indicated in the report of Pulimeno et al. (2020) about the use of children’s stories by health professionals, the use of the storybook reduces the worries on how to present COVID-19 to Akeanon children. Being in printed book format, it would be convenient for parents, teachers and healthcare professionals to use the storybook in teaching about COVID-19, a finding supportive of Burke et al. (2004).

The results of the evaluation of the storybook ‘RO COVID nga Mapanghalit’ looked at the process of producing an instructional resource supporting young children in grappling with the reasons why they should stay at home at the start of the pandemic. Hence, the primary concerns of the storybook were to stay at home and maintain hygienic practices like handwashing with soap, a disinfectant most available in households. The feedback received from three groups of evaluators implies the enormous amount of information people knew about COVID-19 from the time the storybook was conceptualised and distributed in April 2020 and evaluated in the early part of the succeeding year. It was challenging to create a unified mother tongue-based instructional resource relevant to all Akeanon children across broad socio-economic groups. Supporting further development
of appropriate resources for health education and behaviour is in order. The suggestions made are consistent with the challenges identified by Hartling et al. (2010), which include 1) keeping the authenticity of the story against being evidence-based; 2) addressing consumers’ use of the web as the source of health information; 3) striking a balance between being concise, comprehensive and widely applicable; 4) taking into account story length, reading level, narrative mode, depiction of various demographics and exposures to the disease; 5) illustrations; and 6) layout.

5. Conclusion

Previous studies have shown that storybooks could be used as a vehicle to teach young children about significant issues about health, safety, nutrition and behaviour that directly concern them. In the current project, most evaluators grasped the most significant intent in producing the storybook, which is to instil staying at home to stop the virus transmission and observe hygienic practices, such as handwashing with soap and water. The overall evaluation of the storybook, taking into account both quantitative and qualitative data, was highly acceptable.

Intended users appreciated the production of localised instructional material, which allows Akeanon-speaking individuals to relate to the story and identify with the characters. This is addressed to the perceived need and translates to the benefit of the storybook in terms of health literacy promotion. The project also emphasises the need to include additional information on COVID-19 signs and symptoms to maximise its effectiveness for health teaching. The inclusion of enhancements in the storybook, such as contents identified by research at a later stage, was unknown to the instructional material designer during the initial design. These concerns will have to be addressed in future revisions.

Also, this project shows that the ADDIE model can be used to guide the creation of health literacy material suited for young children. The overall appreciation given by the evaluators belonging to various occupations proves the significance of developing instructional material for health education and behaviour. While health literacy material written in English may fit well in an English-speaking community like the Philippines, there will always be room for mother tongue-based instructional material, especially at this period when all validated resources on coronavirus are deemed helpful to raise awareness and encourage appropriate attitudes and behaviours towards the prevention of transmission.

6. Recommendations

Instructional material developers can produce health literacy material in printed form as it remains to be the most accessible to areas of the country with Internet connectivity concerns. Also, it is recommended to continue developing health literacy material in the mother tongue to promote understanding of the important messages on health and safety for young children.

References


