

DEVELOPING A HYGIENE-FOCUSED COLOURING BOOK: AN INNOVATIVE EDUCATIONAL APPROACH FOR PROMOTING SANITATION AND ENVIRONMENTAL SUSTAINABILITY IN GHANAIAN SCHOOLS

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ABSTRACT

This study aimed to develop a new method for a colouring book focusing on hygiene for schoolchildren in Ghana. This approach was designed to improve their understanding of hygiene practices and promote environmental sustainability. Insufficient sanitation has severe consequences, especially for impoverished communities, as it contributes to the spread of infectious diseases that disproportionately affect young individuals. According to the World Health Organisation, a staggering 600 million urban residents lack access to proper housing and basic sanitary services, including clean water and effective waste management. These challenging conditions primarily impact impoverished populations living in remote areas, making them invisible in terms of government assistance for sanitation and healthcare programmes. Inadequate waste disposal methods can lead to fatal infectious diseases like diarrhoea, cholera, tuberculosis, and dengue fever, particularly among young people. The study employed a studio-based approach to develop an educational colouring book. This book, a type of activity book, combines the creative engagement of colouring with instructional content. Its primary aim is to effectively teach children about the importance of sanitation and how to improve their hygiene practices. This colouring book serves as an interactive and enjoyable tool for children to learn about maintaining cleanliness in their surroundings, practising proper hand washing, and disposing of waste appropriately. By engaging children through pictures and activities, the colouring book successfully promotes good hygiene practices and helps prevent the transmission of diseases caused by inadequate sanitation.

Keywords: Sanitation, sustainability, educational colouring book, waste disposal, contagious diseases.

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INTRODUCTION

As visual communicators, we have observed the transformative power of visual communication in shaping understanding and influencing behaviour, a conviction that underpins this work: “Developing a Hygiene-Focused Colouring Book: An innovative Educational Approach for Promoting Sanitation and Environmental Sustainability in Ghanaian Schools.” In Ghana, ongoing challenges of inadequate sanitation and environmental degradation significantly impede public health and sustainable development, particularly within vulnerable school communities. Traditional educational methods often struggle to engage young learners effectively on these critical topics. This research, therefore, proposes an innovative pedagogical intervention: a specially designed colouring book. Through leveraging the inherent appeal of visual storytelling and the interactive nature of colouring, this initiative aims to create a compelling and accessible tool. This tool will not only educate Ghanaian schoolchildren on essential hygiene practices and environmental stewardship but also empower them to become active participants in fostering healthier, more sustainable communities (World Economic Forum, 2020). Through a blend of design principles and educational psychology, this work seeks to demonstrate how thoughtful visual communication can bridge knowledge gaps, encourage behavioural change, and lay a foundational understanding for a more environmentally conscious future in Ghanaian schools.

Making sanitation a reality for all is a top concern for global development, reflected in the UN’s Sustainable Development Goals (SDGs). SDG 6 specifically targets ensuring everyone has access to proper sanitation and hygiene by 2030. This ambitious goal prioritises women, girls, and vulnerable populations, aiming to eliminate the

practice of open defecation (United Nations Development Programme (UNDP, 2023)). Inadequate sanitation is a major global health concern, linked to various diseases in both children and adults. This is particularly true in developing countries. Poor sanitation conditions, including inadequate access to clean water, inadequate disposal of human waste, and inadequate hygiene practices, create an environment that allows for diseases like cholera, typhoid fever, and diarrhoea to spread easily, posing a serious threat to young children. These illnesses can lead to both death (mortality) and long-term health problems (morbidity) in children under five.

The World Health Organisation (2017) identified environment-related factors as claiming the lives of more than 3 million children under five each year and conditions, with unsanitary conditions being a significant contributor. Sanitation-related illnesses also have a disproportionate impact on impoverished communities. Regions with limited access to clean water and sanitation facilities often face a significant burden of diseases linked to poor sanitation. For instance, in Ethiopia, sanitation issues contribute to a large portion of the current health problems, with diarrhoea causing a substantial number of deaths according to a report by the Ministry of Health.

Improving sanitation conditions significantly influences public health, especially in non-industrialised countries. Working towards a world where everyone has safe water, sanitation, and hygiene education can help reduce disease spread and improve overall health outcomes. In this pursuit, educational tools become crucial, and Ozdemir (2017) highlights how comic books offer a promising approach for educating children on sanitation. Comics can effectively capture children’s attention and engage them in learning by combining illustrations and text to convey important information in a visually appealing and simple manner.

Research has shown that using comics in education can create engagement and motivation for children, as noted by Muzumdar (2016). Making learning fun and engaging helps children focus and remember the information better.

However, it is essential to ensure that the content of the comic book does not offend or upset parents (Yulianti *et al.*, 2016). Any cooperation seeking to target schoolchildren must take into consideration the cultural and social context in which the children live. The comic book should be designed in a way that is appealing to the children and aligns with the values and beliefs of the community. The following research questions guide this investigation:

1. What are the key design considerations for integrating colour and visual elements in a comic book to effectively convey sanitation knowledge to schoolchildren?
2. What design approaches and communication strategies can be refined or developed to enhance schoolchildren's understanding of public health announcements and advertisements related to sanitation across diverse traditional and digital media?

Literature Review

There is a saying that, "cleanliness is next to Godliness. Millions of children in developing countries attend schools that lack necessities like clean drinking water and proper toilets, facilities that many of us take for granted (Kaag, as cited in UNICEF, 2023). Every child deserves a school environment with safe water, hygienic sanitation, and hygiene education, she emphasised. The lack of safe water, inadequate sanitation, and poor hygiene not only pose health risks and reduce children's quality of life, but tragically claim the lives of an estimated 1.5 million children under five annually.

Improving water, sanitation, and hygiene (WaSH) services in schools leads to significant benefits. It reduces hygiene-related illnesses and can help prevent the staggering number of 272 million school days missed due to diarrhoea each year. Additionally, proper WaSH facilities are crucial for girls' education. When toilets and washing areas are unsafe, unclean, or unavailable, girls are more likely to discontinue their schooling (Adapted from UNICEF, 2010). In rural Africa and Southeast Asia, a fundamental link exists between sanitation and education. A significant portion of the world's population, estimated at nearly 2.5 billion people, lacks proper sanitation facilities. This basic human need particularly affects children. Not only can inadequate sanitation contribute to diseases that hinder a child's physical and mental development, but it can also prevent them from attending school. Recent statistics indicate millions of school days are lost annually due to water-related illnesses.

While the number of out-of-school children has decreased since 2001, millions still lack access to education due to inadequate sanitation facilities in their homes or schools. This disparity is particularly concerning for girls in South Asia and Sub-Saharan Africa, where a significant portion of unenrolled primary school-aged girls reside. The lack of clean water and sanitation facilities is undeniably linked to health issues. Millions of children each year suffer from waterborne diseases due to poor sanitation and hygiene practices. In South-Saharan Africa alone, over half of the girls who drop out of primary school do so because of a lack of proper sanitation facilities, particularly separate latrines and sanitary supplies for menstruating girls. (Life Water Sanitation Hygiene [LFW, WaSH], Current WASH Data, 2014).

Diarrhoeal diseases, largely caused by poor sanitation and water access, claim many lives, especially among children. According to a recent UNICEF (2023) report, diarrhoeal diseases are responsible for nearly 1,000 child deaths globally each year. This devastating reality is why the United Nations established Sustainable Development Goal 6 (SDG 6), which aims to achieve universal access to clean water and sanitation for all.

Ghana, however, faces challenges in meeting this critical goal. A national campaign launched highlighted the significant economic burden of inadequate sanitation. A World Bank report from 2018 estimates that Ghana loses around US\$369 million annually due to poor sanitation practices. Limited access to proper sanitation facilities is a major hurdle. A Ghana Statistical Service report reveals that only 15% of Ghanaians have access to improved sanitation facilities. The remaining population grapples with insufficient options: 19% practice open defecation, and a staggering 60% rely on shared latrines. Public behaviour also plays a role. Littering and improper waste disposal contribute to unsanitary conditions, hindering progress towards a cleaner Ghana.

The National Sanitation Campaign (NSC) offers a beacon of hope. Thus, by supporting the NSC and adopting good sanitation practices, Ghanaians can collectively achieve SDG 6. A CONIWAS official recently emphasised the importance of a mindset shift, urging Ghanaians to take pride in their sanitation practices. A recent Joint Monitoring Programme (JMP) report paints a mixed picture for Africa. While some countries are making strides towards improved sanitation access, others, like Ghana, face setbacks. This underscores the need for renewed focus and collaboration. Millions across Africa still lack access to basic sanitation and clean water. A recent WHO/UNICEF report estimates that 748 million people globally lack access

to safely managed sanitation. This alarming statistic highlights the urgent need for accelerated action to ensure everyone has access to these essential services.

Diarrhoea, Cholera, and Typhoid Caused by Sanitation

Diarrhoea, a frequent inconvenience for many, is the second most-reported illness in the United States. Adults can expect to experience it around four times a year, while children under five typically battle it seven to fifteen times before reaching kindergarten (Philbrick, 2017). One cause behind diarrhoea is a viral infection, often spread through contaminated surfaces or close contact. These viruses can be highly contagious, easily passing from person to person through unwashed hands, shared utensils, or drinks. Infectious individuals may not even exhibit symptoms themselves, unknowingly spreading the virus to others. Additionally, medication can also trigger diarrhoea. Antibiotics, while effective against harmful bacteria, can disrupt the gut's natural balance, leading to diarrhoea as good bacteria are eliminated alongside the bad. Blood pressure medications, antacids, and even some cancer treatments can have this side effect. If you experience frequent diarrhoea while taking any medication, consult your doctor to discuss potential adjustments. Food intolerance can also be a culprit. This occurs when your body struggles to digest certain components in food, such as lactose in dairy products or artificial sweeteners.

When this happens, the undigested food can cause a variety of discomforts, including diarrhoea, nausea, cramps, and gas, typically within a few hours of consumption. Ghana is currently experiencing a significant cholera outbreak that began in October 2024 and has since spread across multiple regions.

As of mid-February 2025, the outbreak has resulted in over 6,145 reported cases, with 719 confirmed infections and 49 fatalities. The initial outbreak was identified in the Ada East District of the Greater Accra Region in October 2024. Since then, the disease has extended its reach to 36 districts across five regions, specifically Greater Accra, Central, Western, Ashanti, and Eastern. The rapid spread of cholera is primarily attributed to inadequate access to clean water and sanitation facilities. Peri-urban slums and displacement camps have been identified as particularly high-risk areas due to these deficiencies. Unsafe water sources and the unregulated practices of street food vendors are also significant factors contributing to transmission. Analysis of the reported cases indicates that the most affected demographic is individuals aged 21–30 years, followed closely by the 31–40-year age group. This demographic largely represents the active workforce, suggesting a potential broader societal impact beyond health concerns.

Cholera was a major public health concern in the United States throughout the 1800s. This was due to a lack of modern water and sewage treatment systems, which allowed the disease to spread easily through contaminated water. Today, thanks to these advancements, cholera is rarely seen in the US. According to the Centres for Disease Control and Prevention (CDC), only about 10 cases are reported annually, with half originating from travel abroad. While contaminated seafood has caused isolated outbreaks in the US, cholera remains a significant threat in many parts of the world (WebMD, 2017). The World Health Organisation (WHO) estimates that at least 150,000 cases are reported globally each year. Areas with poor sanitation, overcrowding, war, and famine are particularly vulnerable. These regions include parts of Africa, South Asia, and Latin America. As a reminder, cholera is an infectious diarrhoeal disease

caused by the bacterium *Vibrio cholerae*. It can lead to severe dehydration and even death if left untreated. The bacteria spread through contaminated food or water.

Historians grapple with pinpointing the exact causes of ancient plagues, but some educated guesses can be made. One theory suggests that typhoid fever, a bacterial infection, was the culprit behind a devastating Athenian plague around 430 BC, claiming a third of the city's population, including leader Pericles (Thucydides, Peloponnesian War). Similarly, typhoid fever is suspected to have played a role in the near-extinction of Virginia's Jamestown settlement, where over 6,000 colonists perished between 1607 and 1624 (Hunt, 2017). Military campaigns throughout history served as breeding grounds for typhoid fever. The American Civil War witnessed a staggering number of casualties – over 80,000 soldiers succumbed to either typhoid or dysentery (McPherson, 2018). The Spanish-American War also saw outbreaks in training camps and on the battlefield (Philbrick, 2017). A turning point came in 1896 with the development of the first effective typhoid vaccine by Almroth Edward Wright. Initially used by the military, this invention significantly improved soldier health, as typhoid posed a greater threat than battlefield injuries at the time (Heyman, 2016). The vaccine was further refined in London in the following years (Lavine, 2020). The 20th century saw a dramatic decline in typhoid fever thanks to widespread vaccination programmes and advancements in sanitation and hygiene. Chlorination of drinking water, in particular, proved to be a major factor in reducing the disease burden (World Health Organisation, 2024). Today, typhoid fever is considered a rarity in developed nations with an average incidence of around five cases per million people annually (World Health Organisation, 2024).

Mode of Transmission and Infection

In the 19th century, childhood deaths due to diarrhoeal diseases like cholera and typhoid were commonplace in Europe and North America (World Health Organisation, 2020). Today, these deaths are rare in developed regions due to advancements in sanitation (World Health Organisation, 2020). However, the story is far bleaker for developing countries, where inadequate sanitation remains the leading culprit behind child mortality (UN-Water, 2020). According to UN-Water, diarrhoeal diseases claim the lives of over five thousand children every day, making it the second-largest cause of death among under-fives, after pneumonia (UN-Water, 2020). Research suggests that sanitation and hygiene are either the primary or underlying cause of over half of the estimated 10 million annual child deaths in developing nations. Diarrhoea also contributes significantly to malnutrition and stunting in children (UN-Water, 2020). Diarrhoea can be caused by various factors, including viruses like rotavirus (common in children) and Norwalk virus, bacteria like cholera-causing *Vibrio cholera* acquired through contaminated food or water, parasites like *Giardia lamblia* and *cryptosporidium*, medications that disrupt gut bacteria like antibiotics and some antacids, and dietary issues such as lactose intolerance and fructose malabsorption.

The epidemiological data from the Ghana Health Service reveal a significant surge in cholera cases immediately preceding the recent general elections, peaking approximately five days afterwards. This rise is attributed to increased public gatherings, heightened mobility, and potential lapses in hygiene protocols during the electoral period. Although cases have since declined, the National Society (NS) remains vigilant, warning of a potential resurgence during the upcoming Christmas and New Year festivities. These celebrations involve widespread

gatherings, increased patronage of food and beverage establishments, and heightened domestic travel -all conditions conducive to cholera transmission due to large crowds, potential food/water contamination, and reduced adherence to hygiene. Further concerns are raised regarding the swearing-in ceremony of the newly elected government, which typically involves large-scale public celebrations. Such events can compromise food and water safety standards in both formal and informal settings, amplifying the risk. In response to these elevated risks, the National Society (NS) emphasises the critical need for a Disaster Relief Emergency Fund (DREF) to support proactive measures for preventing and managing a likely spike in cases.

Typhoid, a bacterial infection spread through contaminated food and water or direct contact with infected individuals, is caused by *Salmonella Typhimurium* living in human intestines and bloodstreams. Unlike other *Salmonella* strains, typhoid is not carried by animals and is entirely human-to-human.

While some experience high fever and vomiting, others carry the bacteria without symptoms. This increases the risk of transmission, especially in areas with poor sanitation. Washing fruits and vegetables with contaminated water can also spread the disease. Globally, 21.5 million cases of typhoid occur annually, with 75% of cases originating during international travel. Carriers may be restricted from working with the vulnerable population until cleared by a medical test (Medical News Today, 2017).

Prevention of Infections

In response to the escalating crisis, IOM Ghana has partnered with the Ghana Health Service to launch a “Rapid Cholera Response” initiative. This intervention aims to protect vulnerable communities through targeted measures.

While a cholera vaccine is available, it is not being prioritised as the primary intervention for the current outbreak. Instead, the focus remains on enhancing access to improved water and sanitation infrastructure and promoting rigorous hygiene practices across affected areas (Ghana Health Service, 2024).

The World Health Organisation (WHO) highlights that poor sanitation and hygiene are responsible for nearly 90% of diarrhoeal deaths, a leading cause of death for children in developing countries. Lack of access to clean water and basic sanitation also fuels the spread of diseases like hepatitis A, polio, and schistosomiasis. To prevent such infections, primary interventions focus on interrupting the transmission route of pathogens from faeces to the mouth. Improved water supplies, achieved through household connections, public taps, protected wells, or rainwater collection systems, are a crucial first step to ensure people have access to clean drinking water and reduce the risk of waterborne illnesses.

Water safety planning is a comprehensive approach to managing drinking water from source to tap, proactively identifying and mitigating risks of contamination that could cause illness. This ensures a consistent supply of safe, clean water for consumption. To ensure safe drinking water at home, household water treatment and safe storage go hand in hand. This uses methods like filtration, boiling, or adding chlorine to kill harmful microbes, followed by storing the treated water in clean containers to prevent recontamination.

Improved sanitation facilities, as defined by the World Health Organisation (WHO) AND UNICEF, encompass a range of solutions including flush toilets connected to a proper sewerage system, ventilated improved pit latrines (VIP latrines), pit latrines with a slab to improve public health by ensuring hygienic separation of human waste,

thereby reducing the risk of faecal-oral transmission of diseases. Hygiene education encompasses a variety of practices, including proper handwashing after using the toilet and before preparing food, as well as the importance of sanitation. This education empowers individuals and communities to adopt improved hygiene behaviour, which significantly reduces the spread of diarrhoeal diseases. This comprehensive approach is crucial for improving public health and reducing the burden of diarrhoeal illness.

Throughout history, population growth and limited land have challenged waste management. Medieval towns, for example, struggled with increasing waste as more people produced more refuse, while limited land outside city walls restricted designated dumping areas. This lack of proper sanitation, much like London's struggles in the 19th century with overflowing streets and inadequate garbage disposal, led to the spread of disease and death.

Wastewater treatment plants play a vital role in protecting public health by treating water contaminated with human waste and various pollutants through physical, biological, and chemical processes. This treated wastewater is then either released into nearby bodies of water or repurposed for irrigation, while also generating biosolids usable as fertiliser. In contrast, arsenic poisoning arises from consuming water with high levels of this naturally occurring element found in rock and soil. This contamination is a major health concern, particularly in South Asia and Southeast Asia, where prolonged exposure can lead to skin problems, various cancers, and other serious illnesses. It is important to distinguish this from cholera, a waterborne disease spread by poor sanitation and contaminated water, preventable through proper waste disposal, access to safe drinking water, and vaccination.

To effectively combat the spread of infectious diseases, a two-pronged approach focusing on both Sanitation and hygiene is crucial. Poor sanitation, including lack of access to clean water and proper waste management, is a major contributor to diarrhoeal and respiratory illnesses, significant causes of death, particularly among children. Simple hygiene practices like hand washing with soap can dramatically reduce this burden. Similarly, proper food safety and sanitation practices throughout the food processing chain are essential to prevent outbreaks like those caused by contaminated peanut butter or spinach. Regular hand washing is paramount, especially after using the bathroom, handling animals, or caring for the sick, but also before, during, and after food preparation. Studies even suggest that the type of soap can influence hand washing behaviour, with liquid soap dispensers promoting more frequent washing compared to bar soap.

Barriers to Sanitation Prevention

In many sanitation-native regions, where access to basic sanitation infrastructure may be limited, governments and other organisations are turning to health education and awareness-raising campaigns as a way to promote good hygiene and prevent the spread of disease. These efforts can be effective in creating awareness and changing behaviour, but there are challenges to ensuring that these messages reach all populations, especially those in remote areas without access to electricity or other forms of media. Furthermore, targeting children and adolescents with health education messages can be particularly effective in promoting behavioural change. Schools can play an important role in this regard by incorporating sanitation and hygiene education into their curricula and promoting healthy behaviours among students.

Challenges in Achieving Sanitation

Despite significant progress, achieving universal sanitation remains elusive for many nations. Several persistent challenges impede access to safe and hygienic facilities, particularly in developing countries. Rural communities often lack basic toilets and latrines, forcing open defecation practices with associated health risks and social stigma (World Bank, 2023). Vulnerable groups like women and children are disproportionately affected (WHO, 2022). Untreated wastewater contaminates water sources and spreads diseases, hindering economic development and posing environmental and health risks (UN-Habitat, 2020). WaterAid (2023) highlights that sanitation competes with other priorities like poverty reduction, education, and healthcare, leading to inadequate budget allocations in developing countries. Traditional beliefs and social stigma may view improved sanitation as unnecessary or even harmful, requiring behaviour change and awareness campaigns (UNICEF, 2023). Women often face limited access to toilets and menstrual hygiene facilities, highlighting the need to address gender disparities (WSSCC, 2023).

Environmental Sustainability in Sanitation

While effective sanitation is crucial for public health and well-being, traditional methods often come at a significant cost to the environment. Akinyemi *et al.* (2022) highlight the importance of safe waste management, encompassing wastewater, faecal sludge, and solid waste. However, conventional approaches pose serious environmental threats across land, water, and resource domains. Untreated wastewater poses a major threat to freshwater resources.

As outlined by UN SDG 6 (2018), it contaminates rivers, lakes, and groundwater with harmful pathogens and excess nutrients.

This can lead to eutrophication, disruption of aquatic ecosystems, and pose public health risks through waterborne diseases. On land, the consequences are equally concerning. Open dumping and landfills are significant sources of soil and groundwater pollution, as highlighted by the World Bank (2018). These practices leach harmful contaminants into the ground, impacting surrounding ecosystems and potentially threatening drinking water supplies. Furthermore, landfills contribute to greenhouse gas emissions, exacerbating climate change concerns. Traditional sanitation infrastructure also raises concerns about resource depletion. As UNEP (2017) points out, these systems often rely heavily on freshwater and energy for operation and maintenance. This can place strain on scarce resources, particularly in water-stressed regions, and contribute to the global challenge of resource scarcity.

In brief, while effective sanitation is essential, relying solely on conventional methods poses significant environmental risks. From water pollution and land degradation to resource depletion and climate change, the negative impacts are far-reaching. Moving forward, it is crucial to explore and implement more sustainable sanitation solutions that prioritise environmental protection alongside public health.

School Children understand the Advertisement

Children need to learn that advertising is a business tool designed to influence their choices and decision-making. Advertisers use various tactics, such as bright colours, catchy jingles, and celebrity endorsements, to make their products seem more desirable. Children need to understand that these tactics are designed to persuade them to buy products

and that they need to be cautious when making purchasing decisions.

Ultimately, parents play a crucial part in equipping their children with critical thinking abilities when it comes to advertising. When parents help their children understand the goals of advertising, they empower them to make better choices and become informed consumers in the future.

Children and Persuasive Messages

Advertising is everywhere, every day we come across messages trying to convince us of something, no matter where we are or what we are doing. These messages can be more or less obvious (Naderer *et al.*, 2020). The lines between different types of media and the way information is presented are getting fuzzier all the time, which can be confusing for audiences (Borchers and Woelke, 2020; Van Reijmersdal and Rozendaal, 2020). While these challenges apply to everyone, they are especially difficult for children and adolescents to navigate (Lapierre, 2019; Hudders *et al.*, 2017). This is concerning because this age group is a prime target for advertisers (Naderer, 2021). Companies see them as future lifelong customers and exploit the fact that they have not formed strong brand preferences yet (Van Reijmersdal and Rozendaal, 2020). This makes them more susceptible to advertising's influence. Furthermore, children and adolescents already hold some purchasing power of their own. They can influence their parents' purchases and even choose products themselves while shopping together (Borchers and Woelke 2020).

- Before they turn 2, children cannot really tell the difference between commercials and regular shows.
- By ages 3 to 5, kids can spot commercials and know they are different from programmes, but they don't quite get that

commercials are trying to get them to buy something.

- Commercials seem more like fun or informative messages to them.
- They tend to believe what they see and hear in commercials without questioning it.

The Impact of Advertising on Children in Primary School

- By age 6, kids get that commercials are trying to get them to buy something.
- They can remember what they see in advertising.
- They can spot some tricks advertising uses, like making things seem way better than they are.
- However, they might not think critically about why advertising is there or question everything they see.
- They might still believe everything an advertisement tells them about a product, even if it leaves out downsides.

Encouraging children to think critically about advertising can help them become more aware of the persuasive techniques used by advertisers and develop a more informed and discerning approach to advertising by discussing advertising with your child and asking questions about the products and strategies being used, empowering your child to think critically about advertising can be achieved through your guidance. This can also help your child make more informed decisions about their purchasing habits and reduce the impact of advertising on their behaviour. Help your child develop their thinking skills with these questions:

- Are there famous people in the advertisement?
- Does the advertisement show how the product makes something good happen?

- Is there a gift with the product?

History of Colouring Books and Colouring Book Advertising

Colouring books as a medium often reflect the tastes and identity of the culture and time that produced them. Affeldt *et al.* (2018) examine this reflection by comparing American colouring book content as it was produced in the wake of two major traumatic events in American History: the 1941 attack on these two major events in American history are attack on Pearl Harbour and the terrorist attacks on the World Trade Centre on September 11, 2001. As America entered World War II, comic books began to utilise villains in their plotlines that were stereotypes of people from the countries the United States was at war with.

These stereotypes were created and used to subtly deliver the overarching themes and sentiments of the war to younger people (Yulianti *et al.*, 2016). Heroes in these colouring books had superior technological and scientific knowledge but refused to use them for immoral purposes, while the anti-U.S. villains “were willing to use any means at their disposal for the conquest of the world”. Storylines involved real public figures alongside fictional colouring characters, allowing readers to incorporate real-life characters and situations into their colouring book fantasies. Scott describes iconic characters that emerged from this time period, such as Captain America. In the decades leading to the 21st century, colouring books “became more of a socially conscious forum for youth to learn adult themes” (Lin *et al.*, 2016). While colouring book characters such as Spider-Man had been dealing with Vietnam-related issues like campus radicals and veterans coping with drug addiction, colouring rarely strayed into the political realm. This changed after the terrorist attack on September 11, 2001.

Colouring Books in the Classroom: Why Colouring Books?

The “Three E’s Colouring Books” by Josh Elder refers to three key benefits that colouring books offer as educational tools:

Engage: Colouring books are highly engaging for students. They offer an immersive experience that can capture the attention of even the most reluctant readers. With their colourful images, intricate designs, and creative characters, colouring books are a fun way to learn.

Educate: Colouring books can be used to teach a range of academic disciplines, such as the natural sciences, history and society, and communication skills. By pairing text with visuals, colouring books can help students understand complex concepts, improve their comprehension skills, and deepen their knowledge of a topic.

Empower: Colouring books can empower students by giving them a sense of ownership over their learning. As students colour and create their illustrations, they can take an active role in the learning process, which plays a role in developing a strong sense of self-image.

Colouring books are more than just mindless entertainment. They are valuable tools for educators looking to engage, educate, and empower their students. By using colouring books in the classroom, teachers can tap into the natural curiosity and creativity of their students and equip them with the important skills that will be a valuable asset throughout their education and career. Overall, sequential art can be a valuable tool for young children as they develop their literacy skills and learn to make meaning from written material. By providing a visual representation of a story, these books can help children engage with and understand the material, even before they can read text independently.

Colouring Book as Promotional Tool

Torio’s (2015) content analysis of health promotion intervention studies that included colouring books found that the overall effectiveness of colouring books as a health intervention tool was not established. However, they noted that the lack of effectiveness could be attributed to methodological flaws in the studies, such as using colouring books only as a reinforcement method rather than the primary intervention strategy, and not ensuring that the colouring books were read by the intended audience. It is worth noting that product placement and advertising in colouring books influence children in both good and bad ways. This presents an opportunity to introduce children to new products and brands, and create a sense of familiarity and affinity towards them (Affeldt, Meinhart, and Eilks, 2018).

On the negative side, it can encourage materialism and consumerism, and blur the line between entertainment and marketing. Parents and educators should be informed about the possibility of product placement and advertising in colouring books, and have conversations with children about the messages they are receiving from these materials (Christiansen, 2016). Colouring books can be a great promotional tool for a variety of businesses and organisations. They can be customised to feature your branding and message, and can be distributed at events, trade shows, or given away to customers or clients. Here are some ways colouring books can be used as a promotional tool:

- i. **Attract new customers:** Colouring books can be a great way to attract new customers or clients. You can distribute them at events or trade shows and use them as a way to engage with potential customers.
- ii. **Build brand awareness:** By customising colouring books with your branding, you can build brand awareness and help people remember your business or organisation.

iii. Encourage creativity: Colouring books can be a great way to encourage creativity and provide a fun activity for people of all ages. By providing a creative outlet, you can help people relax and unwind while also promoting your brand.

iv. Increase social media engagement: Colouring books can be shared on social media, providing an opportunity for your brand to be seen by a wider audience. You can encourage people to share their completed colouring pages with a specific hashtag or by tagging your business.

v. Promote a cause: Colouring books can also be used to promote a cause or raise awareness for a particular issue. By featuring information about the cause on the colouring book pages, you can educate people while also promoting your brand.

When creating a colouring book as a promotional tool, it's important to keep your target audience in mind. Make sure the designs and content are relevant and appealing to your target demographic, and that your branding is prominent throughout the book.

Theoretical Framework

The Development of a hygiene-focused colouring book: an innovative educational approach for promoting sanitation and environmental sustainability in Ghanaian schools can be effectively underpinned by a combination of established learning theories. This framework integrates Social Cognitive Theory (SCT), Constructivism, and elements of the Health Belief Model (HBM) to explain how the colouring book can influence children's knowledge, attitudes, and behaviours.

Social Cognitive Theory (SCT)

Social Cognitive theory, proposed by Bandura (1986, 1997), suggests that people learn

by watching others and that this learning involves a constant interplay between an individual's thoughts, their behaviour, and their environment. This theory is key because it highlights how a colouring book can teach hygiene:

- Children can learn good habits, like handwashing, by seeing relatable characters doing them in the book.
- Also, by completing colouring activities that simplify hygiene tasks (e.g., waste segregation), children can gain confidence in their ability to perform these actions in real life.
- The book can show positive results of good hygiene (e.g., healthy children) and negative consequences of poor hygiene (e.g., illness), helping children understand why these actions are important.

Constructivism

Constructivism, rooted in the ideas of Piaget (1950s) and Vygotsky (1978), believes that learners build their understanding by experiencing things and reflecting on them. A colouring book supports this active learning:

- Unlike just listening, colouring demands hands-on participation, making children think more deeply about the hygiene messages.
- As children colour and interact with the book, they connect the hygiene messages to their own lives, building a personal understanding of their importance.
- The activities help children organise their thoughts about health and cleanliness, fitting new information into their existing mental frameworks.
- When done in groups, the colouring book can encourage children to learn from one another and reinforce their understanding through discussion.

Health Belief Model (HBM)

The Health Belief Model (Rosencstock, 1966; Becker, 1974) helps design content that motivates changes in health behaviour by focusing on how people perceive health threats and actions. Elements of this model guide the colouring book's design:

- The book can gently show how poor hygiene can lead to illness (e.g., a child with a stomach ache), making children aware of risks.
- It clearly illustrates the positive results of good hygiene, like preventing sickness and keeping the environment clean.
- The book's images and recurring messages serve as reminders, prompting children to practice hygiene daily.

Synthesis

In this case, by combining these theories, the hygiene colouring book acts as a purposeful educational tool. It aims to empower Ghanaian schoolchildren by demonstrating behaviours, boosting their confidence in adopting these practices, clarifying the benefits of good hygiene versus the risks of poor practices, and facilitating their active construction of personal knowledge about health and environmental responsibility. This theoretical foundation ensures the colouring book is a robust intervention for promoting lasting positive hygiene behaviours.

MATERIALS AND METHODS (METHODOLOGY)

This research adopted a creative, hands-on approach known as studio-based exploration. This approach offers a unique and innovative approach to research that emphasises creativity, experimentation, and exploration. It can be a valuable tool for artists, designers, and other creative

professionals who are looking to develop new ideas and concepts, and this could lead to breakthroughs and new understanding in many different areas of study (McDonnell, 2016; Hutchins, 2015). In the world of art research, terms like "studio-based research" and "practice-based research" are the same thing (Patricia, 2014). In the words of Acemoglu *et al.* (2019), in practice-based research, the researchers do not just answer questions with words; they answer them by making something.

Again, involving work in a studio environment practice was chosen because the researchers created a rich or dense account of experiences concerning the application of different tools and materials in the creation of a colouring book (Bispo, 2015). The various tools and materials were experimented with to assess their feasibility for the production of an educational colouring book in a studio setting. The studio-based approach typically involves four main processes, figuring out the problem and what needs to be done, coming up with ideas and designing a solution, building a rough model, for example, to test the idea, seeing how well the solution works, and making changes if needed. These processes are used to guide the researcher's exploration and development of new ideas, and no matter the research question or situation, these tools can be modified to be useful.

Studio-based research is an important approach to knowledge production in the creative field, as it allows artists and designers to explore new ideas and experiment with new techniques and materials. By reflecting on their practice and documenting their process and outcomes, studio-based researchers can contribute to the development of new theories, concepts, and methods in their respective disciplines

(Lester, 2016; Winberg *et al.*, 2018). Unlike conventional research, which typically involves a more structured and systematic approach to gathering and analysing data, studio-based research is often more exploratory and iterative, and is focused on generating new ideas and insights through the act of creation. This approach allows researchers to develop new theories and methods that are grounded in their practice and that are specifically tailored to the needs and challenges of their respective disciplines (Braun *et al.*, 2019; Barret and Bold, 2014).

Studio Experience

The studio, in line with the understanding of Braun *et al* (2018) and Lester (2016) as a space for methodical experimentation and a form of active research, served as the crucial space for translating theoretical insights into tangible solutions for communicating sanitation issues to children. Acknowledging that knowledge is deeply embedded in practice and developed through interaction with specific contexts (Braun *et al.*, 2019), our studio approach moved beyond abstract ideation to an efficient and iterative design process. This involved leveraging the studio's inherent functions of creative exploration, media experimentation, collaborative brainstorming, problem-finding, and ultimately, giving form to ideas of social relevance.

Guiding Questions informing Design

Direction:

The studio process commenced with a critical analysis of insights gleaned from the guiding questions posed to target respondents. This qualitative feedback, concerning children's existing perceptions of sanitation, their preferred visual styles, attention spans, and comprehension level related to health messages, directly informed our initial design hypotheses. For instance, responses

indicating that children found overly complex or abstract visuals difficult to grasp, coupled with a preference for relatable characters and clear narratives, immediately shaped our illustrative approach. The insights also highlighted common misconceptions about germ transmission and handwashing, providing specific educational gaps that the visual communication needed to address.

i. Findings Driving the Design Process:

Drawing from these foundational insights, the design process within the studio was iteratively shaped. Early sketches and conceptual layouts were subjected to internal critiques, with a constant referral back to the respondent data to ensure alignment with children's cognitive and aesthetic preferences. This informed the simplification of complex concepts, the development of engaging characters, and the sequencing of visual narratives to maintain attention. Each design iteration became a new experiment, refining how visual elements could best convey critical sanitation behaviours, such as proper handwashing or toilet usage, in a way that is both understandable and appealing.

ii. The Crucial Role of Colour in

Communicating Sanitation:

Colour played an absolutely pivotal role in communicating sanitation issues effectively to children. Vibrant and contrasting colour palettes were strategically chosen to capture attention and evoke specific emotional responses.

For example, warm, inviting colours were used for clean and healthy environments, promoting a sense of well-being. Conversely, specific muted or slightly unpleasant colours (e.g., dull greens for germs, grey for dirty water) were subtly introduced to represent unsanitary conditions without being frightening, thereby visually distinguishing between desirable and undesirable states. The consistency of these colour associations

helped children quickly infer the cleanliness and safety of different depicted scenarios, reinforcing the message visually.

iii. Illustrative Techniques Employed and Rationale:

A range of illustrative techniques was employed, all with the explicit aim of maximising engagement and comprehension among young audiences. These include:

- Characters with exaggerated, friendly features and rounded forms were created to be highly relatable and non-threatening, appealing directly to children. This technique was chosen to foster empathy and make the characters' actions memorable.
- Strong, defined outlines for all elements ensured visual clarity and readability, even from a distance or on various media, accommodating varying visual processing abilities in children.
- Characters were designed with clear expressions of joy for healthy actions and mild discomfort for unsanitary ones, allowing children to intuitively understand the consequences of different behaviours.
- Similar to comic strip layouts, the use of sequential panels guided children through the steps of sanitation practices, making complex processes easy to follow.

iv. Tailoring the Message to Children's Specifications:

The core message regarding sanitation was meticulously tailored to children's specifications throughout the studio development. This involved:

- All accompanying text and visual cues were designed using simple vocabulary and concepts, avoiding jargon or abstract terms.
- The illustrations depicted everyday

situations familiar to children, such as playing, eating, and using the toilet, making the sanitation lessons directly applicable to their lives.

- Emphasis was placed on showing the actions of sanitation (e.g., scrubbing hands, flushing toilets) rather than just static representations, promoting active learning and habit formation.
- The outcomes of good sanitation practices were consistently depicted with positive imagery (e.g., happy, healthy children), reinforcing desired behaviours.

v. Visual Configurations from Studio Processes:

The iterative studio processes culminated in a series of distinct visual configurations, designed to maximise impact and message retention. These include:

- Complete narratives illustrating scenarios like "The Germ Journey" or "Happy Handwashing Heroes," broken down into sequential, visually engaging frames.
- Large-format visuals combining clear illustrations with minimal, high-impact text, suitable for display in classrooms or community spaces. These often featured a central, appealing character demonstrating a key sanitation behaviour.
- Smaller, portable configurations are designed for hands-on learning, allowing children to physically engage with the sequence of sanitation steps.
- Simplified visual symbols for key sanitation elements (e.g., a sparkling tap for clean water, a smiling toilet), designed for quick recognition and cross-cultural understanding.

Through this methodical and deeply reflective studio experience, grounded in both conceptual research and practical experimentation, the study was able to develop targeted and effective

visual communication tools specifically designed to foster improved sanitation behaviours among children, acknowledging the critical intersection of creativity, design, and public health.

Design Thinking and the Methods of Problem Solving

Design thinking is a way of tackling complex problems by applying methods and thought processes that designers use. In other words, it involves using a designer's toolkit to solve problems. In recent times, it has become a well-liked approach for encouraging new ideas, creativity, and collaboration in a variety of fields, from business to healthcare to education (Brouwer *et al.*, 2015). Design thinking is often associated with the design firm IDEO, which pioneered the approach in the 1990s.

However, it has since been adopted by many other organisations and practitioners, and has become a widely recognised approach to problem-solving. Design thinking also involves a structured approach to problem-solving that helps researchers stay focused and organised. For example, the design thinking process typically involves several distinct stages, such as putting your prototypes in front of real people to see how they react and improve based on their insights.

With the world constantly evolving, strong critical thinking and complex problem-solving skills are becoming essential for achievement in many areas. As a result, many educators and policymakers have recognised the need to incorporate these skills into education at all levels (Olszewski-Kubilius & Thomson, 2015; Acaroglu, 2017). Learning often involves both activity and mental processing, as well as communication with others. Active learning involves engaging in hands-on activities, such as experiments, simulations, or project-based learning, that

allow learners to explore concepts and ideas more interactively and engagingly. By engaging in this kind of learning, students can hone their problem-solving and critical thinking abilities, as well as other practical skills relevant to their field of study.

However, by developing a range of knowledge, skills, processes, attitudes, and thinking skills, learners can become more versatile, adaptable, and effective in their personal and professional lives. Gaining a richer perspective on the world can empower them to become more involved and contribute more actively to their communities (Leblanck & Candau, 2019). In the design thinking process, there is a phase where teams brainstorm and develop solutions. This involves coming up with ideas (putting them down) and clear instructions (creating briefs) to guide this exploration. This involves generating a wide range of possible solutions to the problem, without getting too attached to any one idea too early in the process.

In other words, ACER says creative thinking is about coming up with a lot of varied ideas, playing with them in new ways, and making surprising connections. This lets you imagine fresh solutions that are both original and useful.

This process can involve a lot of creative thinking, as the researchers work to determine the most effective way to present their findings and ideas to their intended audience (Lawless & Brown, 2015; Micheli *et al.*, 2019). They may need to consider factors such as tone, structure, and visual aids like the sketches mentioned to communicate their message clearly and effectively. Creative thinking is a combination of both divergent and convergent thinking, as well as the willingness to take risks and experiment with new ideas.

According to Follett (2016), designing is like a winding journey with constant revisions and

exploration. It begins with a vague idea (like a to-do list) and ends with a detailed product description. Throughout this process, the product itself gets clearer and more defined. The researchers believe that by providing an integrated client experience, businesses can create new opportunities out of the colouring book to build relationships with clients and differentiate themselves from competitors. This can lead to new revenue streams and growth opportunities for the business.

Design Brief and Storyline

Creating an educational colouring book can serve as a means to draw people in and educate schoolchildren on important topics like sanitation. Using a case study like Emmanuel, who is representative of the target audience, can make the content relatable and relevant to the children who will be using the colouring book. Overall, creating a colouring book can be a powerful tool for promoting improved sanitation practices among school children. By paying careful attention to the language and illustrations used, as well as involving local experts, including those involved in the community development procedure, will help ensure that the colouring book is effective and well-received by its intended audience.

Emmanuel and his friends also created a colouring book to distribute to their classmates and the community. The colouring book featured illustrations and stories about the dos and don'ts of sanitation, with Emmanuel as the main character. They hoped that the colouring book would help to reinforce the importance of good sanitation practices in a fun and engaging way. As Emmanuel and his friends settled into their seats, their teacher, Miss Ama, noticed that none of them had washed their hands before coming back to class. She reminded them that washing their hands is an important way to prevent the spread of germs and keep

themselves and their classmates healthy. Emmanuel felt embarrassed that he had forgotten to wash his hands, and he realised that he needed to do better at practising good sanitation habits. He decided to make a list of the dos and don'ts of sanitation to help him remember what he should and shouldn't do.

He started with the basics, like washing his hands before eating, after using the bathroom, and after playing outside. He also reminded himself to cover his mouth when coughing or sneezing and to dispose of any waste properly.

Emmanuel and his friends continued to work on their sanitation club projects, including the colouring book. They created illustrations and stories that showed the consequences of not practising good sanitation habits, like getting sick or spreading germs to others.

The text provided some helpful sanitation advice. It emphasised the importance of washing hands thoroughly with soap and water for at least 20 seconds, followed by drying them with a clean towel.

Emmanuel felt proud of the work they were doing and the impact they were making in their community. He knew that by practising good sanitation habits and spreading awareness about the importance of sanitation, they were helping to keep their community healthy and safe from preventable diseases.

The Role of the Teacher in Poor Sanitation Prevention in School, and Reasons Why Children Should Participate in these Sanitation Activities

The role of teachers in promoting good sanitation practices in schools is critical, as they make a major contribution to educating children about the importance of hygiene

and sanitation. Here are some reasons why teachers should be involved in poor sanitation prevention in schools, as well as why children need to participate in these activities:

- **Educate children about good sanitation practices:** Teachers can educate children about good sanitation practices by incorporating hygiene and sanitation topics into their lessons. This can include teaching children about handwashing, safe food preparation, and proper disposal of waste.
- **Create awareness:** Teachers can create awareness among children about the dangers of poor sanitation practices and their impact on their health and well-being. By helping children understand the importance of good hygiene and sanitation, they can equip them with the tools to make healthy choices that will benefit them for years to come.
- **Encourage participation:** Teachers possess the skills to encourage children to participate in sanitation activities by making them fun and engaging.

For example, they can organise activities such as cleaning competitions or create interactive activities to help children learn about proper hygiene practices.
- **Provide support:** Teachers can provide support and guidance to children in adopting healthy sanitation practices. They can help children overcome any barriers that prevent them from practising good hygiene, basic necessities like clean drinking water and toilets.
- **Lead by example:** Finally, teachers can lead by example and demonstrate good hygiene and sanitation practices themselves. Exposing children to these practices can make them value their importance and inspire them to incorporate them into their daily routines.

In summary, the role of teachers in promoting good sanitation practices in schools is essential for ensuring the health and well-being of children. By educating children about the importance of hygiene and sanitation, creating awareness, encouraging participation, providing support, and leading by example, teachers play a key role in shaping children's lifelong health habits.

Prototype and Finishing

Prototype and finishing are two important stages in the product development process. In simpler terms, a prototype is a first crack at a product, built to iron out any kinks. It is like a trial run to see if the design works before they make a bunch of them. Designers and engineers use prototypes to find and fix problems early on, saving time and money in the long run. They can build these prototypes in all sorts of ways, from fancy machines to even crafting them by hand. There are several benefits to creating a prototype, including:

- i. Identifying design flaws and improvements.
- ii. Testing functionality and usability.
- iii. Providing a tangible representation of the product.
- iv. Evaluating manufacturing processes and materials.
- v. Communicating ideas to stakeholders and investors.

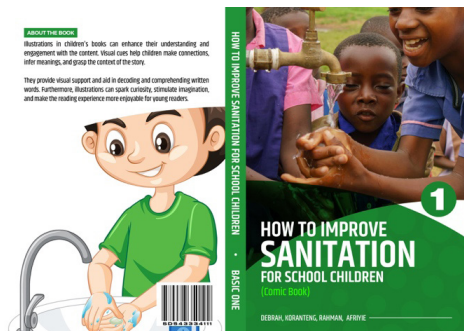
Once the prototype is finalised and all issues have been resolved, the next step is finishing. Finishing refers to the final stages of preparing the product for production, including refining the design, selecting materials, and determining the manufacturing process. During finishing, designers and engineers will refine the product based on feedback from stakeholders and any issues identified during the prototype stage. Finishing can also include selecting packaging, labelling, and branding for the product. This is an important

step in ensuring the product stands out in the market and effectively communicates the brand's message and values. Prototype and finishing are critical stages in the product development process. Additionally, creating a prototype and refining the design during finishing and through careful design and development, engineers can create a product that fulfils customer desires and stands out against the competition.

Creating prototypes is a valuable step in any product development process, including book production. Using normal bond paper for the prototypes is a cost-effective option that allows the researchers to test the layout and arrangement of the pages before committing to more expensive materials. The purpose of the prototypes, as mentioned, is to help the researchers succeed in the accurate imposition of the book. Imposition refers to the process of arranging pages in a specific order to ensure that they will print correctly and in the right order. As such, by creating prototypes and arranging the pages

in an orderly manner, the researchers can ensure that the final printed book will be easy to read and navigate.

Creating prototypes is an important step in book production, as it allows for testing and refinement of the design and layout before final production. Using normal bond paper for the prototypes is a practical and cost-effective option that can save time and money in the long run. Using Matt with chromo coat paper for the front and back covers is a great choice for durability and aesthetic appeal. The use of A4 paper for the inside pages is also a common and cost-effective option. Collating the pages in chronological order is an important step in ensuring that the book is readable and makes sense to the reader. Perfect binding is a popular binding method for books with a larger number of pages, as it provides a durable and professional-looking finish. The use of art paper for printing is also a good choice, as it can enhance the visual appeal of the book, particularly for images or illustrations. This can be seen in Figure. 1



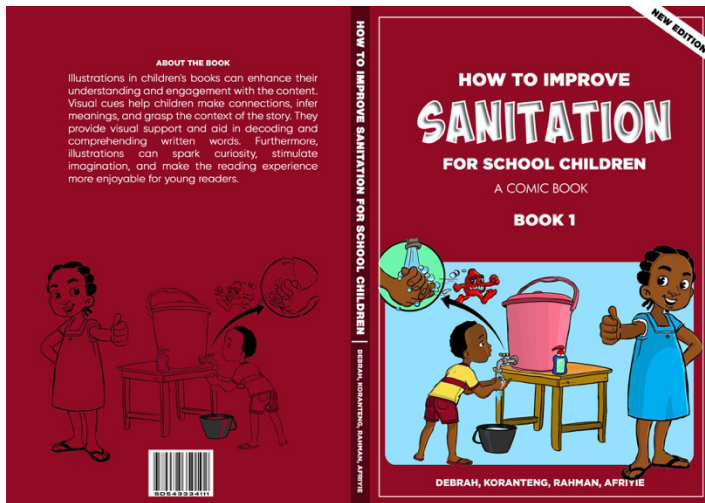


Figure 1: Proposed book cover designs for consideration and selection

RESULTS AND DISCUSSION

Pre-Testing

The objective of this study was to assess the clarity and effectiveness of an educational book, specifically designed for basic school children, through a rigorous pre-testing phase. The pre-testing aimed to identify potential problems and gather crucial feedback from both the primary and ancillary target audiences before a full-scale study.

To achieve this, researchers conducted pre-testing where the book was presented to a diverse group, including the main target group (basic school children) and the auxiliary target group (teachers, parents, and guardians). Initially, feedback was sought from the auxiliary target group through verbal interviews, where portions of the book were given for reading. The general comments highlighted that the text content was simple and easy for children to read, and the font size was large and legible.

Subsequently, basic school children, as the main target audience, were also given sections of the book to read. Their feedback

primarily focused on the illustrations, which they found to be self-explanatory and well-aligned with the storyline. Many children also perceived the illustrations as a very effective educational tool for the topic.

This initial survey, conducted through interviews with both target groups, provided researchers with valuable insights into consumer expectations for the design book, significantly influencing its final production.

The feasibility of the project was further tested by observing a selected number of pupils from the target group. Each child was asked to read a portion of the book and then connect it to its corresponding illustration to demonstrate understanding. The book was also designed as a colouring book, allowing children to use their own colours. Teachers, parents, and guardians continued to provide feedback, expressing their approval of the book's formulation, its coherence, and especially the general presentation and the accompanying illustrations as shown in Figure. 2. The positive responses from these consumers validated the researchers' initial

objective, confirming the book's potential

effectiveness.

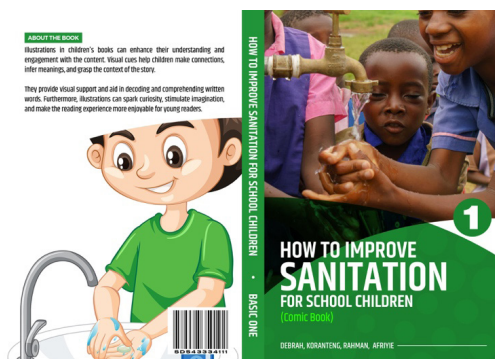


Figure 2: Selected and final book cover design for the project

Participants' Comments on the Colouring Book

Parents' Comments:

According to one participant, Parent 1 commented that;

"I appreciate how simple and easy to read the text content is. It makes it so much more accessible for my child to follow along and understand. The big font size is a huge plus. It's very legible and doesn't strain my child's eyes, which is important for early readers." (Field interview, 2024)

Another participant, Parent 4, similarly noted;

"This book is a truly effective educational tool. My child learned a lot about the topic in a fun and engaging way. You can tell the producers listened to feedback. This book meets our expectations for what a children's educational book should be." (Field interview, 2024)

Children's Comments:

According to one target participant, Pupil 1;

"The words are super easy to read. I can read them all by myself. I love that the words are big. It helps me see them better."

(Field interview, 2024)

Another respondent, Pupil 3, had this to say;

"The pictures tell the story without even needing to read all the words. They're so clear. The drawings are great, and they go with the story. It's fun to colour and learn." (Field interview, 2024)

Teachers Comments:

To confirm whether the researchers have achieved their purpose,

A teacher commented;

"From an educational standpoint, the text content's simplicity and readability are excellent for basic school children. It supports their literacy and development. The large, legible font size is ideal for classroom use, ensuring all students can easily engage with the material" (Field interview, 2024)

Another teacher participant also highlighted;

"The illustrations are exceptionally self-explanatory and perfectly align with the storyline. The visual support is invaluable for comprehension. This colouring book is a highly effective educational tool. It successfully conveys the chosen topic in

an age-appropriate and engaging manner for young learners. Consumer expectations were considered during production. This book is well-tailored to the needs and preferences of basic school children."

Evaluation

This section delves into evaluation research, a specific approach that applies standard social science methods to assess the value of something. We will explore why evaluation research is conducted, then examine its core principles and various types. The researchers estimated, from the results gathered from the pre-test, that the set objectives of the project had been attained. It has been affirmed from the results that the book can go a long way in encouraging basic school pupils within the scope of the project to achieve set objectives. The researcher realised that the book would be more helpful if the general reading of the target was accessible on the internet for a wider spread of the scope of the project, and also to meet the needs of the computer-literate. Also, this book, in a unique way, is going to kick-start a new wave of reading among basic school children, especially primary school students. The target group will also be encouraged to learn the basic ways of improving the widespread, which invariably will secure their future by preventing any occurrence.

CONCLUSION

This project, "Developing a Hygiene-Focused Colouring Book: An Innovative Educational Approach for Promoting Sanitation and Environmental Sustainability in Ghanaian Schools," has significantly advanced its core objective of creating an effective educational tool. The researchers gained in-depth knowledge of digital rendering, layout, and illustration techniques specifically suitable for children's educational materials. For instance, the project illuminated how to

visually communicate essential hygiene practices, such as the need for primary pupils to wash their hands with soap and water before returning to the classroom after break time.

Beyond the immediate output, this research highlights the power of illustration as an invaluable tool for creating simple yet effective educational designs. The successful development of this colouring book demonstrates that good illustrations and thoughtful layout are paramount for enhancing readability and comprehension, especially for young learners. Additionally, by encouraging engagement through visual learning, this project is poised to foster a crucial reading habit among the target group and broaden their understanding of sanitation and environmental sustainability.

In essence, this research has successfully developed an innovative and useful educational tool that directly addresses the promotion of sanitation improvement among Ghanaian schoolchildren, thereby contributing to the attainment of the Sustainable Development Goals (SDGs), and can serve as a valuable reference material or handbook for students interested in digital rendering to expand their knowledge and skills, ensuring continuity in learning providing a reliable resource for future students and subsequent researchers undertaking similar projects, as a wide range of professionals will also find it useful.

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