College of Medicine and Health Science

A QUALITATIVE STUDY EXPLORING THE SUITABILITY OF INFORMED HEALTH CHOICES RESOURCES TRANSLATED INTO KINYARWANDA FOR USE IN PRIMARY SCHOOLS:

Case Of Remera Protestant Primary School In Kigali City

A dissertation submitted in partial fulfillment of the requirements for the degree of

MASTER OF PUBLIC HEALTH

By

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DECLARATION

I, Aline IKIREZI, do hereby declare that this work has never been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the thesis itself.

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ABSTRACT

Introduction: Primary schools children are capable of understanding some of the key concepts needed to recognize unreliable claims and how to make informed choices about their health. The Informed Health Choices (IHC) project was designed to develop and test these learning resources for primary schools aim to teach children some of these skills. This study objectives are threefold: i) to explore the user experience of the IHC primary school resources among children and the teacher of primary five in Kinyarwanda; ii) to identify barriers and facilitators of the IHC school resources in Rwandan context for effective use; and iii) to incorporate users' recommendations that can inform the next reiteration of these resources in the next development cycle (Version 3).

Methods: The study used qualitative methods to explore user's experiences (i.e. pupils aged 9-17 (7 girls and 20 boys) and teacher (1)) and their perspectives about IHC resources in Kinyarwanda. The study used a convenient sampling strategy to select a school and purposive sampling to select children and the teacher. For each of the IHC school resources of 9 lessons, the researcher conducted non-participatory observation of the lesson with at least two observers, a user-test interview with the teacher and a focus group discussion with three children. The content analysis of users' experiences was conducted using modified honeycomb framework: usefulness, usability, credibility, identification, understandable and desirability.

Results: In the first objective, the study found that the user experience was appropriate since their assessment indicated usefulness, identification, usability, credibility, understandability and desirability of the IHC resources. In the second objective, the barrier to the IHC material was time constraint while the facilitators included curiosity and positive attitude towards the IHC materials. In the third objective, both the pupils and the teacher suggested that the IHC material be distributed to other pupils in other schools so they can also benefit from the teachings and importance of making informed health choices.

Conclusion: Methods used in this study could be of value for evaluating other educational resources in Rwanda. The researcher suggests changes that could improve the learning resources for use in Rwanda.

Keywords: Suitability, informed health care choices, health literacy, children, teacher, and school resources.

DEDICATION

I dedicate this thesis report to God Almighty for the gift of life, good health, and all the efforts rendered and to my parents who supported me financial, emotionally, and spiritually.

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LISTS OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
AMA	American Medical Association
EBHC	Evidence-Based Healthcare
ESSP	Education Sector Strategic Plan
GBV	Gender Based Violence
HIV	Human Immune Virus
IHC	Informed Health Choices
MINEDUC	Ministry of Education
REB	Rwanda Education Board
RNEC	Rwanda National Ethical Committee
SH	School Health
SIHCLIC	Supporting Informed Healthcare Choices in Low-Income Countries
SPH	School of Public Health
STIs	Sexually Transmitted Infections
UNESCO	UN Educational, Scientific and Cultural Organization
USDHHS	US Department of Health and Human Service
WHO	World Health Organization

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CHAPTER I: INTRODUCTION

1.1 Definitions of key terms

A **claim** is something that someone says that can be right or wrong.

A **treatment** is something you do for your health.

An **effec**t of a treatment is something that a treatment makes happen.

Health is how well your body and mind are.

An **informed choice** is a choice made when you understand the information that you have.

Critical thinking: the objective analysis and evaluation of an issue in order to form a judgment.

1.2 Context

The pilot study was conducted in Kicukiro District where SPH is located in G.S Kicukiro Protestant school. The study was an evaluation a set of learning resources which were created to teach children to recognize and assess claims about health care treatments and to make informed choices. In this work, we explored the suitability of these resources, translated to Kinyarwanda, for primary school children in Rwanda within the age group of 10-12 years.

1.2.1 Rwanda Primary Education System and Literacy

Since the launch of the Nine Year Basic Education Policy in 2006, expanding free and compulsory education to nine years, the enrollment rate from Primary 1 up to Senior 3 has improved remarkably. The primary national net enrollment rate improved from 73.3% in 2000/01 to 95.9% in 2011.[1] Similarly, there was an improvement in enrolment rate of 96.8%, 96.9% and 97.7% in 2014, 2015, and 2016 respectively.[2] Furthermore, the completion rate among primary school children improved greatly from 60.4% in 2015 to 65.2% in 2016.

Indeed in order to improve learning achievements in Rwanda, the government has started to pilot initiatives intended to assess learning achievements with the support of development partners.

However, the results of those initiatives show that certain portions of students still do not meet the learning achievement criteria set out in Rwanda's national curricula.[3]

The low learning achievement was attributed to high pupil to teacher ratio. For instance, in 2011, the national average of the number of pupils per classroom in public schools for primary education was 81. However; due to the accomplishments of government initiatives, in 2016, the number of pupils per classroom was 45. The reduction in number of pupils per classroom is an indication that pupils are able to have enough interaction with the teachers since pupil to teacher ratio is sustainable. On the other hand, the Curriculum & Pedagogical Materials Department of the Rwanda Education Board (REB) carries out syllabus review every 3 to 4 years and curricula revision every 5 years. The curricula were revised to respond to the change of language of instruction from French to English, and this process is almost completed. The Department also has a role to ensure textbooks and reading materials related to the curricula are available for procurement by schools.[4]

Furthermore, MINEDUC reported that a considerable number of pupils, particularly in lower primary, did not transit from one grade to another between 2015 and 2016. This might be associated with a number of factors, in particular those related to literacy, numeracy and school environment.[5]

1.2.2 Rwanda School Health Policy

In order to improve students' learning environment, the Government of Rwanda developed a comprehensive School Health Policy[3] and Strategic Plan with recommended policy actions in eight key areas: health promotion and disease prevention and control; HIV, AIDS and other STIs; sexual and reproductive health and rights; environmental health; school nutrition; physical education; mental health; and gender based violence issues. An effective implementation of this School Health (SH) policy aims to promote an enabling school environment; improvement in academic outcomes for all students; combating of HIV and AIDS, malaria and other acute and chronic health conditions; addressing hunger and malnutrition reducing child mortality; and improvement of maternal health.

Indeed, school health issues are among the priorities of the Government of Rwanda and are addressed in various sectors and strategic plans. The Education Sector Strategic Plan (ESSP)

2013/14-2017/18[2] called for a holistic approach to SH, covering issues related to HIV and AIDS, multiple acute and chronic health conditions, disabilities and special educational needs, sexual and reproductive health, hygiene, school feeding, school environment, mental health, trauma and sports.

The value of SH policy stems from the importance of promoting the health of students and the effects on wellbeing and learning outcomes. The learning capability of many children is reduced due to situations and behaviors which jeopardize their physical, mental and emotional status. This SH policy is aimed at identifying and mainstreaming the key health interventions for improved school health, nutrition and education.

1.3 Background

A claim is something that someone says that can be right or wrong.[6] For example, Raymond's claim: "I had the flu. I drank a glass of juice. The next, day my flu was gone! Therefore, drinking juice cures the flu!" Basis for claim: Raymond's experience of his flu going away after drinking juice. Explanation: Raymond's basis is bad, so his claim is unreliable. It is possible that his flu would have gone away without the juice.

Many causal claims about health treatments are demonstrably wrong. Although some are well intentioned, others are deliberately misleading to serve interests other than the well-being of patients and the public.[4] Belief in unproven claims about the benefits of health interventions prevents people from seeking effective healthcare, can lead to improper utilization of health services and can cause harm. When people are unaware of the difference between reliable and unreliable health and interventions, they may ignore effective health services or health programs available to them and instead use ineffective interventions that can put their lives in danger without their knowledge.

For health practitioners trained in Evidence-Based Healthcare (EBHC),[5] learning how to judge which claims to believe is a core competence. However, it is not only practitioners who need to be able to apply these skills. Patients and the public also need to be equipped to assess the trustworthiness of treatment claims. Merely teaching people to trust claims backed by research is not sufficient, as research results may also be unreliable. Additionally, there is much public

mistrust of research. A survey of 2041 adults commissioned by the UK Academy of Medical Sciences reported only 37% of the public said they trusted evidence from medical research, compared with 65% who trusted the experiences of their friends and families.[7] Unfortunately, skills to assess the trustworthiness of causal claims remain rare.

Therefore, an international team of researchers initiated the Informed Health Choices (IHC) project (earlier known as "Supporting Informed Healthcare Choices in Low-Income Countries - SIHCLIC). The objectives of this project were to develop and evaluate resources for primary schools and mass media resources designed to improve the ability of children and adults to assess claims about the effects of treatments. The project's focus was on low-income countries. In the project, treatments meant any action intended to maintain or improve health. One aim of this work was to improve the health literacy of children age 10-12 years by teaching them to assess claims about treatments and make better choices concerning their health and well-being. SIHCLIC was funded Research Council of Norway from January 2013 to December 2017.[8] The key partners were the Norwegian Institute of Public Health, Makerere University in Uganda, Great Lakes University of Kisumu in Kenya, the University of Rwanda, and the James Lind Initiative in the UK.

1.4 Problem Statement

The ability of individuals to obtain, process, and understand basic health information is a critical element in making healthcare choices.[9] However, such abilities are often limited in both the developed and developing world.[10,11,12,13] Evidence from studies evaluating people's understanding of informed consent, randomization, risks and drug approval among patients, their caregivers and the lay public suggests that people's ability to assess benefits and harms (effects) of treatments is low. These inadequacies often result in low uptake of preventative and curative interventions, and inappropriate utilization of health services.[14] They also create communication barriers between health workers and patients and increase costs of care.[15]

Furthermore, some individuals' lack of capacity to understand critical health information leads them not only to avoid using effective treatments, but leads them to choosing ineffective options.[16] The high prevalence of self-care, including self-medication, in low-income countries such as Rwanda compounds this problem. These factors form a compelling argument for

introducing initiatives that could empower the public to think critically about treatment claims and make more informed healthcare choices.

However, it might be difficult to teach adults such skills. It has been well documented that health-related knowledge and behaviors developed during childhood are foundational, deeply rooted and resistant to change as children mature into adulthood.[17] Therefore, the strategy of equipping young people with knowledge and skills might be an effective path to addressing unproven claims about health from numerous sources.

1.5 Significance of the study

Persuasive health product adverts and claims of effects of treatments and wellness products are commonplace. Some of the health information conveyed through the media may be erroneous, unsubstantiated, biased, misleading, and sometimes driven by commercial interests.[18] People need to be able to assess the reliability of these claims. It therefore follows that improving the ability of media audiences to evaluate health information might improve how that information is understood and used by the public.

To address the above challenge, the IHC research project was established. The project team developed primary school resources and a podcast series to improve the ability of children and their parents to assess claims about treatment effects and make informed health choices.[19] Trials conducted in Uganda tested the effect of the learning resources among parents (podcast) and teachers and children (primary school resources).[20, 21]

As a part of this work, we established the current study to explore use of the IHC primary school resources and how they might be adapted for successful implementation in Rwanda. This study can be seen in light of an overarching aim to improve health literacy in Rwanda by improving people's ability to assess and use information about the effects of treatments, through teaching initiatives at the primary school level.

The results of this project will inform the further development of resources that address the question of whether the resources can work in the Rwandan context. It is in this context the researcher has sought to respond specifically to the following question, aim and objectives of the study.

1.6 Research Question

Can the IHC primary school learning resources for assessing claims about the effects of treatments and making informed treatment choices work in the context of Rwanda?

1.7 Aim

The aim of this study is to pilot Version 2 of the IHC primary school resources among Primary Five children in the Rwandan context, evaluate the suitability of the resources for use in this context, and how the resources might be improved.

1.8 Specific Objectives

i. To explore the user experience of the IHC primary school resources among children and the teacher of primary five in Kinyarwanda;
ii. To identify barriers and facilitators of the IHC school resources in Rwandan context for effective use; and
iii. To incorporate users' recommendations that can inform the next reiteration of these resources in the next development cycle (Version 3).

CHAPTER TWO
LITERATURE REVIEW

2.1 Health literacy

Health literacy could be defined as little more than an understanding of health information and instructions. However, that somewhat simplistic definition understates the current literature on the subject. Indeed, being a "relatively new construct" much effort has been made to clarify its meaning. In her undertaking of a concept analysis of health literacy, Speros claims that the first recorded use of the term was in 1974 in a paper calling for baseline health education standards for all school grades in the USA.[22] Speros noted that until the early 1990's the few references made to health literacy were in the context of, and defined by, the traditional measures of literacy, namely, reading and comprehension. Health literacy was not regarded as a distinct concept until 1992 when physicians affiliated with the American Emory University in Atlanta and the UCLA Medical Centre in Los Angeles undertook a two year study focusing on the measurement of health literacy in English and Spanish speaking adult outpatients of two public teaching hospitals.[23] This seminal work described health literacy as being able to apply literacy skills to health related materials such as prescriptions, appointment cards, medicine labels, and directions for home health care.

Definitions of health literacy have since reflected a conceptual evolution of ideas and understanding derived from a growing body of research.[24,25 ,26] Three definitions in particular stand out for their repeated use in the relevant literature and are provided by the American Medical Association's (AMA) Ad Hoc Committee on Health Literacy, The US Department of Health and Human Service (USDHHS) and the World Health Organization (WHO). According to the AMA, health literacy is "a constellation of skills including the ability to perform basic reading and numerical tasks required to function in the health care environment".[27]

A broader perspective is evident in the definition adopted by the US DHHS, which states that health literacy is "the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions".[28]

Whilst seemingly comprehensive, both definitions fail to account for contexts beyond health care settings, such as work and the community, and limit their scope to individual abilities. The WHO definition of health literacy, despite its earlier genesis, seems to address those 'failings' by encompassing notions of empowerment, health promotion, education and social benefit: "Health literacy represents the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand, and use information in ways that promote and maintain good health". Health literacy means more than being able to read pamphlets and successfully make appointments. By improving people's access to health information and their capacity to use it effectively, health literacy is critical to empowerment.[29]

Examples of actions that require health literacy skills include properly reading and adhering to a care or prevention program as well as being able to use the available healthcare services rationally and ponder individual behavioural change. Increasing health literacy rates is a means to empower patients and contribute to reducing inequalities towards a healthier, safer, more demanding society.[30]

Since health literacy is a primary contributing factor to health disparities, it is a continued and increasing concern for health professionals. Approximately 80 million U.S. adults are thought to have limited health literacy, which puts them at risk for poorer health outcomes. Rates of limited health literacy are higher among elderly, minority, poor persons and those with less than a high school education. In sub-Saharan Africa, health literacy is low among the poor, less educated, elderly and young children under 12 years, with most of them unable to read whole sentences or understand and make appropriate health decisions.[31]

In Rwanda, the following factors have been shown to strongly associate with the low level of health literacy: age (especially those 65 years and older), limited English language proficiency, less education, and lower socioeconomic status.[32] Low health literacy reduces the success of treatment and increases the risk of medical error.[33]

Various interventions, such as simplifying information and illustrations, avoiding jargon and encouraging patients' questions, have improved health behaviors in persons with low health literacy. In a study from 2010, the proportion of adults aged 18 and over in the U.S. who reported that their health care providers always explained things so they could understand them was

60.6%.[34] However, these intervention strategies have been targeted only at adults. There is a need for earlier interventions of health literacy that would improve health outcomes in children and children's families at large. This might be a long term and sustainable approach to improve literacy, especially for literacy related to improving or maintaining good health.

2.2 Strategies to Improve Health Literacy

A health-literate person is one who is able to make inferences from health information, draw conclusions and understand cause-and-effect relationships between action and results. He or she is able to read and understand information on food labels, and the required daily nutrients of food items, as well understand the meaning of blood sugar, blood pressure and body mass index numbers. Given that a poor understanding of health and health-related issues can lead to higher rates of illness and poor self-care, it is in the best interest of the public for healthcare providers to introduce strategies that can help improve health literacy levels among patient populations.

Several studies, conducted among adults and parents, have concluded that people's ability to assess health information is generally low and, in most cases, lacking.[35] However, only a few have focused on health literacy among children, and all these have been done in high-income countries.[36] Health-related knowledge, attitudes and behaviours developed during childhood are increasingly being recognized as foundational, deeply rooted and resistant to change later, when children become adults. Yet we have not been able to identify any studies (outside of the IHC project) that have addressed children's assessment of claims about treatment effects. Children between the ages of 10 and 12 years in some countries are taught about fair tests and critical appraisal, but not with a focus on health or specifically teaching them to assess claims about the effects of health care interventions.[37]

An overview of six systematic reviews of educational interventions in low- and middle-income countries found 227 studies in total that reported student learning results.[38] None of these studies addressed health or scientific literacy or critical thinking more broadly. A systematic review of the effects of instruction on the development and enhancement of critical thinking skills at any age, and in any setting, found 49 studies of the effects of strategies for teaching primary school children (aged 6 to 10 years) to think critically, none of which focused specifically on health literacy or assessing claims about treatment effects.[39] Similarly, reviews that have focused

specifically on teaching children critical appraisal skills in relation to health have not found any studies that evaluate the effects of strategies to teach these skills to primary school children anywhere.[40]

Teaching children how to assess claims about the effects of treatments might be effective for several reasons. First, children are capable of learning about fair tests and critical appraisal between the ages of 10 and 12 years, and teaching these basic skills is already part of the curricula in some countries.[41]

Second, it is possible to reach a large segment of the population before they drop out of school, since large numbers of children drop out after primary level in low-income countries.[42] Primary school in Rwanda comprises six classes from primary one (grade 1) to primary six (grade 6) completed during a period of 6 years, with the official age range for primary education level being 6–12 years. However, children attending primary school are generally aged between 6 and 17 years or even older in some schools, especially in rural areas.' The UN Educational, Scientific and Cultural Organization (UNESCO) has estimated that 68% of children in Rwanda who enroll in primary school are likely to drop out before finishing the prescribed 7 years.[43]

Third, teaching children at primary school level to assess claims about treatments can capitalize on children's natural curiosity and enthusiasm to learn. Fourth, there are opportunities for children to share what they have learned with other children and family members (parents or guardians). In addition, primary schools play an important role in many communities in sub-Saharan Africa, particularly Rwanda, where 42.6% of the population are below the age of 15 years.[44] Therefore, teaching basic concepts in schools about how to assess claims about the effects of treatments might create opportunities for both the children and their families to learn the critical appraisal skills that they need when assessing the benefits and harms of treatments. Finally, a good foundation for a healthier society might result from teaching children to ask questions about treatment claims and how to assess health information about treatment effects before the formation of problematic health attitudes and behaviours in adulthood.[45] For these reasons, pilot-tested IHC resources were designed and developed to help teach children how to assess claims about the benefits and harms of treatments.

2.3 User Experience Frameworks to Assess Health Resources Information

The concept of exploring user experience has origins that can be traced back to the field of human computer interaction, where an early emphasis was on measuring usability – the effectiveness and efficiency of a product and personal satisfaction of a user to the product.[46] There are a number of frameworks proposed by the literature of other fields that can be used to evaluate the design and development of resources. For instance, the update of Roger's original Diffusion of Innovation Framework was based on a meta-review of empirical research from 11 different research domains. It is a whole-systems model, comprised of seven components: a) the innovation itself, b) the adoption process, c) communication and influence, d) the inner organizational context, e) the outer inter-organizational context, f) the implementation/sustainability process, and g) the linkage between components.

Additionally, the Canadian Institute of Health Research Knowledge Translation proposed a model that was based on a cyclical concept of research. Six points were identified within the cycle where interactions, communications and partnerships that could facilitate knowledge translation may occur. These included defining research questions/methods, conducting research, publishing research, placing findings in context of other knowledge, making decisions/taking action, influencing subsequent research.[47]

Furthermore, Kietzmann et al., used a honeycomb framework in their study "Unpacking the social media phenomenon: towards a research agenda".[48] This honeycomb model helped explain the implications that each component of the honeycomb can have for how firms should engage with social media in three important ways. In fact, each building block of the model presented an important social media phenomenon that could be understood using a number of theories. The framework illustrated the methodological usefulness of this honeycomb model for building powerful and novel combinations of theoretical approaches for studying social media platforms, consumer engagement, content sharing and community needs. The model categorized user experience in seven dimensions: presence, relationships, reputation, groups, conversations, sharing and identity.

On the other hand, Rosenbaum in her PhD thesis used a different honeycomb framework for exploring user experience of evidence from fair comparisons and systematic reviews.[49] Two new

categories emerged from her work: “Understandability” and “Identification”. An adjusted honey comb framework is described below.

Source: Adopted from Rosenbaum (2010)

Rosenbaum defined each facet of the honeycomb-adjusted framework as follows;

Findability: can users locate what they are looking for?

Accessibility: are there physical barriers to actually gaining access, also for people with handicaps?

Usability: how easy and satisfying is this product to use?

Usefulness: does this product have practical value for this user?

Credibility: is it trustworthy?

Desirability: is it something the user wants? Has a positive emotional response to?

Identification: Does the user feel the product is for "someone like me" or is it alienating/foreign-feeling?

Understandability: Does the user recognize what the product is and does she understand the content?

We chose to use this adjusted honeycomb framework by Rosenbaum because it is a limited and pragmatic framework, focusing narrowly on the interactions of a user with a product for the purpose of understanding how the product could be improved. It is not a broad framework – for instance it does not explicitly cover the broader scope of social, physical or cultural systems that those interactions are embedded in.

We used the adjusted honeycomb framework in the expounding of barriers and facilitator factors in using IHC resources. For instance for the teachers, skills, competencies and understanding of the content was explored while for the children, literacy and motivation were explored. Furthermore, in teaching resources, compatibility and appropriateness was explored.

CHAPTER 3: METHODS

3.1 STUDY DESIGN

We used qualitative methods to explore user's experiences (i.e. pupils and teachers) and their perspectives about IHC resources. We used three methods: non-participatory observation[50], user test interviews[51], and focus group discussions.[52]

3.2 INTERVENTION DESCRIPTION – THE SCHOOL RESOURCES

Our interventions included the use of IHC school resources developed for primary five school children. These resources were founded on 12[53] of the 24* Key Concepts relevant to primary school children that were developed by the IHC project to help people understand and apply them when assessing treatment claims and making informed health care choices.[54] The IHC primary school resources included a textbook, the exercise book, the poster, the activity cards (lesson 7), and a teachers' guide[45, 46].

The teacher's guide was translated to Kinyarwanda and consisted of 10 chapters that guided the teacher to teach concepts to assess claims. The children's resources were translated to Kinyarwanda and consisted of 10 corresponding chapters that were each comprised of three parts: a story in the form of a comic, a set of exercises and a class activity. The pilot study took a period of 10 weeks, covering two lessons per week, and each lesson lasted for a proximately 40-45 minutes. The lessons were conducted outside normal schools, that is, from 15:00-16:00. However, lesson schedules were flexible since they often changed in favor of prioritizing normal academic programs in the school

3.3 SAMPLE DESCRIPTION

3.3.1 Target Population

After obtaining authorization from the Mayor of Kicukiro District, and a verbal pre-approval by that district's school authorities, we contacted one school for inclusion in the study. The school authorities then gave their approval for that school to participate. The school was a large urban and public primary school that has primary one up to primary seven. After all the processes of approval were done, we then conducted our study. The target population included primary-five children enrolled in school at the time of the study. Primary-five children in Rwanda are, on

* Key Concepts are updated annually, and the latest version can be found at www.informedhealthchoices.org

average, between 10 and 12 years old, though in some cases some students were older, up to 17 years old. The teacher who would deliver the lessons was a primary-five science teacher who taught science to children aged 10-12. There were no other inclusion or exclusion criteria for the teacher. The children were selected on the basis that their parents signed the informed consent form sent to them. The children were also required to sign the Assent form.

3.3.2 Sampling method

After the approval from the district authority, we conducted the head teacher of the selected school to seek permission to carry out our study from the school. The head teacher then gave us a go-ahead to conduct our study.

When we were at school, we used purposive sampling strategy to select a teacher to facilitate ten lessons in the resources, by asking the head teacher to identify teachers that met our inclusion criteria. We then selected one teacher and requested her to find a class in primary five streams for teaching the ten lessons. The teacher made a verbal communication with all the primary five streams and conveniently gathered a group of children who exhibited interest in taking part in the study. The inclusion criteria entailed the consent of the pupil's parents and guardians, and we also asked pupils to sign an assent form to confirm their participation. However, we had to exclude some children whose parents and guardians did not consent.

At the end of each lesson, we selected three children from the class to participate in a post-lesson focus group discussion. We chose different children for nine post-lesson focus group discussions. We created a balanced group of children where there was equal number of girls and boys in the study. This was intended to promote gender balance.

3.4 CONSENT

We obtained the teacher's consent by giving her comprehensive information about the study and a consent form to sign. We encouraged the teacher to ask questions where she did not understand properly. The teacher asked a number of questions which we responded to until she was satisfied. We discussed with the teacher the purpose of the study and explained how we would like her to participate. We told her that we were testing the children's book in particular to find out if there were some errors or lack of clarity in the Kinyarwanda used in the book. We asked

her to read and check through the lessons and give her comment where the Kinyarwanda was wrongly written, in addition to teaching the classes and providing feedback in the interviews.

Additionally, we prepared assent forms and consent forms for the children and gave the teacher to distribute. The teacher asked the children to take the assent forms and the consent forms to their parents and guardians. The assent forms and the consent forms were returned two days after their distribution. We considered only children whose assent forms were filled out and the consent forms of their parents and guardians were signed. However, we also verbally explained to the children in a more elaborative detail about their role in the study and gave them the opportunity to ask questions related to the pilot.

3.5 DATA COLLECTION

3.5.1 Pilot testing

We conducted a pilot test of the nine lessons in Children's book. We first introduced the teacher to the materials and explained her roles in the study. The teacher then used the Teacher's guide to teach each lesson while the children followed the lesson using the Children's book. Each lesson was planned for 45 minutes, though some lessons took up to one hour and twenty minutes. Children were given pencils, sharpeners and rubbers to use in case they needed write answers or make notes.

3.5.2 Non-participatory observation

Three researchers observed all nine lessons and collected observation data. Researchers observed and recorded how each lesson was conducted using a pilot observation form along with a copy of the Teacher's guide to follow page by page.

The pilot test observation form was designed to note information about each page of the Children's book and the Teacher's guide as the lesson progressed. Researchers took notes on how the teacher used and understood instructions, and what the children and teacher misunderstood or omitted.

After each lesson, researchers noted more general observations, such as how much time the lesson took, number of children in the classroom and number of benches used, how the teacher engaged the children, what seemed to interest children and the teacher, and details such as whom

read aloud, and how the black board was used. After each observation, researchers discussed and entered three sets of findings in an excel spreadsheet.

3.5.3 User testing with retrospective think-aloud

User testing is a method used in formative evaluation of a product to gather user feedback based on actual use. “Think-aloud” technique is commonly used for data collection in user testing: the participant uses the product to carry out tasks that are relevant for them, while “thinking out loud” at the same time, giving the observing researcher insight into the participant’s thoughts about what they are doing, seeing, thinking and feeling while using the product.[55]. In this way, the researcher gains an understanding of the user’s subjective experience, and at the same time can observe the participant’s actual behavior with the product. This provides a rich set of data that can be analyzed to understand problems and lead to improvement of the product.[56]

We wanted to capture qualitative data in this way, but to do so during an actual lesson would be highly disruptive. So we organized children’s focus groups and teacher’s interviews to carry out user test type data collection after lessons were finished. In both user test interviews and focus group discussions we used retrospective think aloud technique. This meant that the participants were remembering their recent use of the product and describing their actions and reactions as they recalled them, instead of providing this description at the same time as product use.

3.5.4 Focus Group Discussions with Group Think-Aloud

We conducted nine focus group discussions with think-aloud technique and three children in each. The classroom teacher participated in the selection of the children on the basis of inclusion criteria, mixed gender and age range, as of participation is voluntary we asked those who are available three of them and pick purposively. We asked children their profile which included age, gender and stream. We then guided them through a retrospective think-aloud session. We told them to read the children’s book each page at a time while thinking aloud. Afterwards we asked them what they thought about each page of the book, what was difficult to understand, what should be improved, and what should be less or more. The children took turn in responding to questions and their answers did not interfere with each other’s answers. We asked the children general questions in the areas of usefulness, usability, credibility, understandable and

desirability. We also asked the children were if they had any suggestions for improving the book or the project in general. All focus group discussions lasted for less than one hour.

3.5.5 User Test Interviews

We conducted user test interviews with one teacher after each lesson delivery. Two researchers conducted the interview, with one moderating and the other taking notes. We audio recorded each session, with permission from the teacher. We used an interview guide structured to collect information from the teacher about the use of resources. The teacher's profile in terms of age, gender, educational level and work experience were also recorded. The interview commenced by asking the teacher to read the Teacher's guide book page by page while thinking aloud. The researchers recorded what the teacher thought on each page of the book, what was easy, what was difficult to comprehend, and what needed to be changed.

Furthermore, we asked the teacher general questions about understandability, desirability, identification, usability, usefulness, credibility and value of the resources. All user test interviews lasted for one hour.

The interview guides (both for the teacher and children) were based on an adjusted Peter Morville framework (honeycomb) to explore some of the dimensions of user experience[41]. The interview form used adapted seven dimensions including understandability, identification, usability, usefulness, credibility, desirability, and value.

3.6 DATA ANALYSIS

In this study, we used thematic analysis for all data from pilot test observations, user test interviews and focus group discussions. We also gathered all the findings in one file, and then analyzed them in three stages according to objectives of the thesis. In addition, all the three stages of analysis were conducted by the three researchers to categorize themes from data.

In the first analysis, we explored the user experience of the teacher and children on the use of IHC school resources. These were framed in a more general way so that they could also be useful for informing other work besides this project; such as future version of this work adapted more specifically for Rwandan context. We tagged all findings using the same adjusted honeycomb framework that we used to create the interview guides. After initial tagging of findings by

researchers individually, we altogether retagged together, discussing each finding and arriving at a consensus. This led us to identify themes that described children and teacher's user experience of IHC resources.

We rated all the findings according to the seriousness categories described (Appendix 1). The aim of the rating was to categorize each finding as either a problem (in three different levels of seriousness) that could hinder effective use of resources; as praise of characteristics of the resources that should be kept unchanged; or as a suggestion of desired improvements or changes. This rating was done first by one researcher during initial data analysis, and was reviewed and rated again by two researchers.

The second analysis was to look at the findings in a broader perspective and identify barriers and facilitators to implementing the IHC resources in Rwanda. We analyzed the same set of findings in a more general way beyond the experiences of users with the resources, looking for barriers and facilitators of using IHC school resources in Rwanda. We used a barrier and facilitator's framework adapted by the IHC project team. We did go back to all the original data that was entered in the excel sheet and re-tagged it according to all the new domains and factors in this framework and then tagged it for seriousness code. In addition to tagging domains and factors, all the findings were rated using an adjusted set of seriousness codes to inform the perceived seriousness of the barriers and facilitators.

The third analysis was to explore the users' suggestions for consideration in the development of new version of IHC resources. Through discussion in the group of three researchers, we identified the corresponding solutions for suggested changes of the IHC resources. Appendix F gives the summary of the barriers and facilitators that we found.

3.7 ETHICAL CONSIDERATIONS

Respect of persons: We asked all participants to sign an informed consent form approving their voluntary participation. Participants who did not give informed consent were not interviewed. Interviewees were audio recorded only on condition that they consented; those who did not consent were not audio recorded. Parents or guardians of the students were requested to fill an assent form; only students whose forms were filled participated in the study. We obtained the teacher's consent through the informed consent form that she filled in.

Remuneration: Participants were not compensated monetarily. However appropriate daily expenses in form of lunch and transport were reimbursed for attending any study related meetings or workshops. All school children who participated in the pilot study were given their copy of the resources, the Children's book and Exercise book, to own.

Vulnerable populations: Children for whom data was collected were considered a vulnerable population. All persons involved in data collection activities complied with rules and regulations protecting children involved in research activities from physical violence or harm[57]. Children were asked to voluntarily participate in the study. In the event that they felt tired or demotivated, we assured them that it was not an offense to opt out of the study at any time they wanted to.

Confidentiality: The information provided to the research team was kept confidential in accordance to the ethical standards agreed upon by the local and international organizations governing the conduct of research involving human participants. Any information resulting from this study did not reveal any participant's identity.

Ethical clearance: We received ethical clearance from the Rwanda National Ethical Committee (RNEC) so as to be able to conduct this pilot test.

CHAPTER FOUR: DATA ANALYSIS RESULTS

4.1 PARTICIPANT'S CHARACTERISTICS

We conducted nine cycles of non-participatory observations with at least two of the three researchers for each lesson, nine test interviews for the teacher and nine focus group discussions comprising of three different children in each group. Only one stream was selected, comprising of approximately 44 pupils who all had assent forms. Three different children in each of the nine focus group sessions were selected. Table below gives the summary of how pupils participated in the focus group sessions.

Table 1: Summary of Participants in Focus Group [Think Aloud]

Groups	**Boys**	**Girls**	**Total**
Group 001	1	2	3
Group 002	1	2	3
Group 003	1	2	3
Group 004	1	2	3
Group 005	0	3	3
Group 006	1	2	3
Group 007	2	1	3
Group 008	0	3	3
Group 009	0	3	3
Overall total	**7**	**20**	**27**

The important aspect of the study was that while the selected children participated in the study, the rest were playing at the football field and the school compound. Thus the children that participated in the study did not miss any academic curriculum. This is because the study was done outside normal class lessons. In other words, it was done after the normal class lessons for the day was completed. Characteristics of participants in interviews are presented in table 2 below.

Table 2: Characteristics of Participants in Interviews

IHC Resources	**Interviews**			
Chapters	**No. Participants [pupils: both girls and boys]**		**Age range [years]**	**No. Participants [Female Teacher]**
	Total No. of pupils who participated in lessons	**Actual No. selected for Interview**	**Pupils**	
Chapter 1	43	3	9-17	1
Chapter 2	42	3	9-16	1
Chapter 3	41	3	9-16	1
Chapter 4	40	3	9-16	1
Chapter 5	38	3	9-16	1
Chapter 6	40	3	9-16	1
Chapter 7	36	3	9-16	1
Chapter 8	36	3	9-16	1
Chapter 9	36	3	9-16	1
Average time per session	**30 minutes**			**30 minutes**

4.2 USER EXPERIENCE OF CHILDREN AND THE TEACHER ON IHC SCHOOL RESOURCES

The findings were categorized from observation and focus group discussions from the pupils and user test interviews from the teacher. We characterized the findings into positive feedback and negative feedback using the modified honeycomb framework: usefulness, usability, credibility, identification, understandable and desirability. Additional facets of the honeycomb such as findability and accessibility were not included in the study. This was because the honeycomb framework was originally developed for evaluating human computer interactions. Since these

resources were on paper, some aspects of these facets, such as “findability”, and “accessibility” did not apply. Although assessing “accessibility” could be relevant to paper-based resources, user testing interviews would not be the best way to assess problems like colorblindness issues or access to people with extremely bad eye sight.

4.2.1 Positive User Experiences

The main user experience findings were usefulness, identification, usability, credibility, understandability and desirability.

Usefulness

The children expressed feeling that the book was useful to them, because they felt it helped them gain more knowledge, have more ability to read and even succeed in competitions. In addition, they felt it helped them learn about health and be able to explain what they learned to others.

> *“This exercise of page 24 is not common but after doing it we gained knowledge about health and that can be useful for us in the future because if you want to become a medical doctor it can help you or even in your normal life.” “I find this book very important for me because it will help me to improve my life. Thank you for writing such book for us because it increases our knowledge”* (Child, 001).

> “*When you are reading you gain more knowledge and more ability to read Kinyarwanda so that even if they take you in a competition for reading, you can succeed because of this book of stories”* (Child, 003).

> *“You may be healthy but be unable to explain what health is; but now we learnt about it we can be able to explain to anyone anytime”* (Child, 002).

> *“they are appropriate to P5 children because they teach us to tell the truth…I found the content to be appropriate to P5 children because those children, when someone tells them something, instead of thinking before acting they act without thinking.”* (Child, 009).

> “*I think this book is appropriate for children of our age group because it teaches us how to choose treatments… because it helps us to protect our future lives”* (Child, 018).

Identification

Regarding the identification of the book, children and the teacher agreed that the book was adapted for P.5 standard and the book was well written with illustrated picture-examples.

> *"For me I see that this book is for a level like ours because you cannot teach that to secondary school students"* (Child, 002).

> *"this book is well adapted to children our age group, maybe secondary school students may need to edit it but for us there is no problem"* (Child, 005).

> *"I find this book to be at our level because apart from the pictures, they have put examples showing activities of children like a playground where boys can play and get injured. They have put many advices for children to eat healthy meals, to play with caution, to avoid being fooled by adults. They show us how to care for our lives in order to be examples to others"* (Child, 001).

> *"this book is appropriate to children of our age group and even when we shall be grown up"* (Child, 010).

> *"During the lesson they were giving me their own examples similar to those written in the book. That shows that it fits their level, it's not above their level, it is related to their daily life." "Indeed it is adapted to them because what I teach them they understand and it is part of their normal lives"* (The Teacher).

> *"Reading this book is not difficult for us because the stories are concerning children of the same age as we are and they have tried to simulate our daily lives"* (Child, 011).

Usability

The teacher also consented that the content of the book was ease to use because she felt that the materials were clear and good for use by this age group.

> *Not only for words but also the whole book, you don't only read it as if it is a journal but it has illustrations adapted for children…..It is well written without errors" (Teacher).)*

"it is clear and even very good that the child has an exercise book where they can write with pencils so that if they got a wrong answer, they can rub it off. This is very good" (Teacher).

Everything in the book is clear and … adapted to the age of the children…..pictures are very good and they are fitting the children's age. Colors attract the children, and the pictures are painted in a simple way" (The Teacher).

Credibility

The children indicated they would trust the content because they believed that the government would not allow the book to be released without checking it.

"For me I trust that it is the truth because the one who drafted it could not tell lies and the government could not allow them to release this book, to give it to children without first checking" (Child, 003).

When asked whether the lesson they had learned in the book could be trusted or it is the truth, the pupils and the teacher indicated that they felt they could trust the content of the book since it taught them how to behave in their every day's life

"For me it was the truth….Because they were teaching us how we should behave in our every day's live" (Child, 004).

"I trust that the lesson in this book is the truth because they teach us how to take different decisions before drinking a medicine; this can have a good effect on us. This book teaches us to think carefully before using any treatment" (Child, 007).

The children's perception of the trustworthiness of the book was also influenced by their experience of the content as educative and informative of real life health issues that many of them said they had been mis-informed about.

"I believe what is written in the book because all the stories are related to what we meet in our daily lives, things you fall in if we are not careful; this book helps us to first think carefully before doing what we are told. It doesn't have complications; it is useful for us." (Child, 010).

The teacher also observed that the content of the book was trustworthy because it reflects things they know from their normal life experiences.

> *"Yes, I trusted it… because those are things we already know from the normal life…those are part of the common life, nothing new, that is why I believe that it is the truth." if I read from student's book, that story is well written, the pictures are very good…The Kinyarwanda there is clear and even in my guide, the content is clear and similar to what is in the students' book"* (The Teacher).

> *"Yes, what they say is the truth because it is what we meet in every day's life. Apart from the treatments, this also can be useful for us teachers while we are making groups of children, how to create groups for homework* (The Teacher).

Understandability

The lessons appeared to be well understood by the children and the teacher. The children explained that the lessons tell them to think carefully about what they are told for knowing if it is true or wrong.

> *"It tells us to think carefully about what they tell us in order to know if it is true or not"* (Child, 006).

> *"It tells me that we should first think carefully about what you are going to do like someone who may think that because something is new, it must be better than what was already in usage"* (Child, 009).

> *"This book wants to tell us about treatments. As an example, someone can tell you to put chromozol in your eyes while you don't have the same disease; it is not good to do it without thinking because it can have bad effects on your eyes"* (Child, 010).

> *"The way I understand it, even if you are told something by an expert, you should not believe it blindly….. you must be careful before using any treatment"* (Child, 011).

> "*The children are responding to what they have understood during reading the story*" (Observation).

The teacher also displayed a basic understanding of the content. She concurred that it is important for the pupils to think carefully before they can make a decision about anything that affects them.

> *"Children should think carefully before doing whatever is told to them. Especially about treatments, they should not use them immediately but first of all, they should think carefully* (The Teacher).

> *"The lesson is very important and interesting because during the lesson…they seemed awaken by the lesson, making them realize that they should be responsible for their lives, doing attention not to believe what sellers are saying about what they sell, or what elder people or experts are telling them. They should first think carefully about everything* (The Teacher).

While many of the pupils had no difficulty in understanding the lessons, some of them did. The teacher clarified them elaborately to the pupils who had some difficulties. The responses from the children were summarized as below:

> *"I didn't find anything difficult and even I think that it was easy for all the children because the one who had some difficulties has asked the teacher or the classmates and they explained to them* (Child, 005).

> *"The content is not difficult for us children because we still have a fresh mind that help us to understand quickly and to think about the usefulness of what we learn in the future for ourselves and our families"* (Child, 010).

> *"for me there is nothing difficult, everything is clear, even the teacher explained to us what we didn't understand"* (Child, 013).

The children also indicated that if given the opportunity, they would advise their age mates to think carefully before making a decision.

> *"I can tell them that I learnt to first think carefully about what is useful for you and for your friend before doing anything* (Child, 011).

> *"I could answer to the one who asks me that they learnt about unfair and fair comparison. The reason why the comparison was fair is because they threw a piece in the air while deciding who will get juice and who will get water* (Child, 017).

The teacher also responded of how she would explain the lessons of the book to a colleague:

> *"I would explain to him/her the objective of the lesson which indicates that we should not base our belief about the effects of a treatment on what an expert says…… we should think carefully about it before taking a decision* (The Teacher).

Desirability

The children acknowledged their desire to read the book because of its attractive pictures and good examples. One of the children was quoted as saying:

> *"The way I saw it, this story is easy because it has many different good things like pictures, examples, different stories and again, there are no difficult words to understand. All that can attract us to read this book, nothing complicated"* (Child, 011).

4.2.2 Negative User Experiences

Many of the negative user experiences were about understandability. The pupils and the teacher had difficulty understanding some of the content in the book. The researchers observed that as the pupils tried to read and understand some of the pictures that did not have explanations, they would not ask their teacher questions for purposes of clarity. For the children, this appeared to be due, at least partially, to limited time. Children claimed that they were not allowed to ask questions due to time constraints.

> *"The disadvantage we are meeting here is that when we are being taught, they don't allow you to ask question for more clarification, they tell us that there is no time; they should also hear from us or from other children so you could explain where we didn't understand well"* (Child 002).

Similarly, the teacher complained of the issue of time:

"The activity is clear but it takes a lot of time…. The only challenge is time. In that book there are many activities, 3 activities; Due to time constraints, I chose to give them one, this one was not given but it was clear. There is also a second and a third exercises but I didn't give to children because the time was too short" (The Teacher).

4.3 BARRIERS AND FACILITATORS TO IMPLEMENTATION OF IHC RESOURCES

4.3.1 Barriers related to using IHC resources in Rwanda

The study further explored other factors that might have hindered the effective use of IHC school resources in Rwanda. The main barriers related to children and the teacher (those characterized by high seriousness ratings XXX) were issues about time constraint.

The teacher was quoted as saying:

"as we teach other lessons during 40 minutes, these lessons are very long" (The Teacher).

Furthermore, the teacher found out that there were some activities that were difficult and needed a lot of time, and the teacher did not give this activity to the children. She said:

"There was one activity that was difficult and necessitated a lot of time; that is why I haven't given it to them…..The first one was complicated; it would take a lot of time and need a lot of explanations" (The Teacher).

In a similar manner, the teacher found out that there were no examples in the lesson 7, and that it was hard for the children to come up with their own examples. The teacher said:

"The only thing I realized in this lesson 7 is that there are no examples, not even a single one. I asked the children to give their own examples but it was hard for them….this chapter 7 was difficult for them to understand. There were 3 comparisons of 10 people followed by 3 comparisons of 100 people and it was like too much for them, so hard for them to clarify the different results" (The Teacher, lesson 7).

"The exercise of asking questions took a lot of the time because it was done in groups (benches), and every group was writing on the blackboard the answer" (Observation).

"The teacher doesn't go through in all activity she summarizes during the time of reviewing the last lesson" (Observation).

4.3.2 Facilitators related to using IHC school resources in Rwanda

The main facilitators related to the children, teachers and the use of IHC school resources in the context of Rwanda included: curiosity, and attitude relating to IHC resources.

Curiosity

The pupils demonstrated their curiosity towards the IHC learning material. My observation, I noticed that the pupils were interested in participating in the learning process. Most of whom raised their hands for answering questions and some of them elaborated their points by giving examples. I also observed that the teacher allowed children to first discuss about treatments, effects of treatments and health researcher (15 minutes) (Observation). In fact in regard to curiosity, the teacher indicated that:

"When I gave the exercise to children, 33 out of 38 got all the answers, the others failed only 1 question; no one got zero. Few children failed only 1 answer out of 3, that is a proof that they understood well the lesson (The Teacher).

Attitude towards IHC material

The pupils hinted what the book was all about by explaining the importance of making informed health decisions. The pupils also believe that with this information, they can support their parents, friends, and relatives to make better and informed health choices so as not to fall victim of unsubstantiated health claims. One pupil was quoted as saying:

"This book can be helpful to anyone including my father, mother, and siblings because it teaches people to first think on what they are told. This is because it is very important to think carefully before making health claim, a health decision" (Child, 005).

4.4 PERCEIVED USER SUGGESTIONS TO IMPROVE IHC RESOURCES

The content of IHC material in Kinyarwanda language was highly understood by both the teacher and pupils. Most of the Kinyarwanda words according to the teacher were on point, except for few glitches in typing error that needed rectification. The pupils on the other hand pointed that the book was suitable for their level given the fact that most of pictorial illustrations identified with the daily environments they interact with. Thus in terms of understandability, usability, and usefulness, the pupils consented that the book was largely meant for their age group. In the same rhetoric, they suggested that the benefits they have got from the book be extended to other pupils within the same age group across the country.

CHAPTER 5: DISCUSSION AND CONCLUSION

5.1 DISCUSSION

The aim of this study was to address three objectives: to explore the user experience of the IHC primary school resources among children and the teacher of primary five in Rwanda, to elaborate on the barriers and facilitators for effective use of the IHC school resources in Rwandan context, and to identify from users the findings that can inform the next reiteration of these resources in the next development cycle (Version 3).

5.1.1 User Experience of IHC School Resources Among Children and the Teacher

The results from the study indicated that the user experience of the pupils and teachers regarding IHC resources had both positive and negative feedback. The modified honeycomb framework helped to develop themes that explained user experience. The themes that were adapted for this study included: usefulness, identification, usability, credibility, understandability and desirability.

Usefulness

The finding revealed that the children expressed feeling that the book was useful to them, because they felt it helped them gain more knowledge, have more ability to read and even succeed in competitions. In addition, they felt it helped them learn about health and be able to explain what they learned to others. The fact that the pupils are able to come to terms with the fact that the IHC material is useful to them because it gives them necessary knowledge to make informed health decisions implies that the incorporation of the IHC in the primary schools in Rwanda will help many pupils be critical thinkers in making choices that affect their health at early stages of their lives. In other words, teaching children how to assess claims about the effects of treatments at an early age is more effective since children will be capable of learning about fair tests and critical assessment. In addition, it is possible to reach a large segment of the population before they drop out of school, since large numbers of children drop out after primary level in low-income countries. In Rwanda, the school dropout rate at primary level as of 2016 was 34.8% and it was higher among the boys with 40.7% and girls only at 28.9%[2].

Furthermore, the teacher indicated that the IHC resource was useful because it could be used in real life to inform members of the community to be careful in taking health advices from

individuals or media sources which are not credible. This implies that with the IHC resources, the communities can benefit from simple way of making comparisons and doing deeper consultations with health professionals regarding health claims before making an uninformed decision that could later turn to be detrimental to their health. Therefore taking interest in IHC resources might be a gateway to engage school staff, teachers, parents and community officials and all actors to collectively improve health in the schools and community at large. This therefore implies that IHC resources are useful to both the children and the teacher in helping them assess health claims and make the right health choices.

Identification

Regarding the identification of the book, children and the teacher agreed that the book was appropriate for children within the age group of 10-12 years who are in P.5 standard and that the book was well written with illustrated picture-examples. This implies that pupils within the age group of primary five can easily identify with the IHC material because of the simplicity in the presentation in terms of language, wordings, examples, and pictures. Thus as they interactively read through the IHC material, they discover that it is not actually something unusual but rather something they interactive with on a daily basis. This is because all of the health claims used as examples in the book are those which the children are already familiar with in their school environments, homes, and surrounding communities. Therefore, the introduction of the IHC material to the primary schools in Rwanda will help to a greater extent fulfil the Rwanda school health policy which is bent on "providing skills-based health education with a focus on promoting well-being, preventing health problems, promoting activities appropriate to children's intellectual and emotional abilities and helping children to make healthy choices and adopt healthy behaviors throughout their lives."[58]

Usability

The teacher indicated that the book was well written with few errors and with clear illustrations. The teacher also consented that the content of the book was easy to use because she felt that the materials were clear and good for use by this age group. This implies that the IHC material according to the teacher can be used to teach pupils about critical thinking that would later foster better health choices in one's life. In other words, the high level of clarity in the way the book

communicates health claims to the pupils makes it more desirable to be used as a facilitator of making better informed health choices. Therefore, for decisions about actions to improve or maintain the health of pupils or communities to be well-informed and not misinformed, teachers need reliable information about the effects of such treatments and their claims. Hence, creation of comic books such as IHC with clear illustrations facilitates understanding and makes it easier for the children to read and understand the text as well as engage them[59]. In addition, since children at schools, homes, and community use Kinyarwanda as the main language of communication in daily lives, they might pass on health information more easily among people they encounter with in daily lives if they have resources in this language.

Credibility

The children indicated they would trust the content because they believed that the government would not allow the book to be released without checking it. When asked whether the lesson they had learned in the book could be trusted or it is the truth, the pupils and the teacher indicated that they felt they could trust the content of the book since it taught them how to behave in their every day's life. This implies that the children's perception of the trustworthiness of the book could have been influenced by their experience of the content as educative and informative of real life health issues. In other words, the children and the teacher perceived the IHC resources as credible due to their content, applicability and source. In fact before the pilot of this study, ethical clearance was sought from the Rwanda National Ethical Committee (RNEC) and was granted after several background checks. Thus it is true that the content of IHC material is credible and can be relied on.

Understandability

The children explained that the lessons tell them to think carefully about what they are told for knowing if it is true or wrong. The teacher also displayed a basic understanding of the content. She concurred that it is important for the pupils to think carefully before they can make a decision about anything that affects them. Additionally, the lessons were explained to the teacher by the researcher using the Teacher's guide and the teacher clarified them elaborately to the pupils who had some difficulties. This implies that the ability of the pupils and the teacher to understand the content of the IHC material makes them to have the desire to apply its

communications in their daily lives. However, failure to understand the original intent of IHC material can lead to miss-information. A case in question is a study conducted in Rwanda to test IHC material in English Language. The findings indicated that due to poor understandability, the children and the teacher thought that the lessons were teaching them how to use medicine, not how to assess treatment claims. In addition, the teacher was not able to explain some lesson contents to another person[60].

Desirability

The pupils indicated that the IHC material was desirable because of the way the stories were displayed. There were pictures and illustrative examples which were much easier to comprehend and that attracted the pupils towards reading even the more. The teachers also agreed that the colors in the IHC material made it more desirable for the pupils to read the book. The high level of desire to study the IHC material could have largely been attributed to how the pictures were painted in a simple and understandable way and how a bird like Kasuku could "talk". Given the age group under study, "a talking" bird could have sparked interest in the lesson and making each subsequent lessons more fun for the children.

5.1.2 Barriers and Facilitators of Using IHC School Resources in Rwanda

The main barriers related to children and the teacher were issues about time constraints. For instance, there were some activities that were difficult and needed a lot of time, and the teacher did not give this activity to the children. This could have been attributed to the timing of the pilot study where the pupils were engaged only after the evening lessons. Such a time finds when children are already exhausted and most of whom would want to go home. In any case better time given to a given activity is a prerequisite for better comprehension of a given study activity. Thus for pupils to understand better a new knowledge such as "informed health choices", it is apparent that, such new initiation be given enough time and better timing should be given priority. However, contrary to the findings of this study, other studies did not seem to see time as a barrier, but rather understandability of IHC resources. For instance, a study found that the main barriers to IHC resources literacy, beliefs, and understanding of the content being taught[61]. This is because children struggled with reading and understanding of the contents because it was written in English and not in Kinyarwanda which they are familiar with.

5.1.3 Perceived user suggestions to improve IHC resources

For the most part, teachers and students gave very favorable feedback about the resources; however, users also discovered some anomalies and gave their suggestions for purposes of improvement of the next version of the IHC material. For instance, according to the teacher, some lessons had no or few examples, while others had way too many examples. In the same vein, some of the available examples included too many activities that consumed too much time. Therefore, it would be judicious to cause this kind of modification in the next version of the IHC resource.

Some of pupils and the teacher suggested that materials should be shared with pupils of other schools. The pupils and their teacher esteemed the importance of the IHC resource in promoting an informed treatment decision. They therefore found it necessary that other pupils should benefit from the same. This is a strong indication that the IHC were valued and shows that the participants were satisfied with the content.

The teacher also suggested the improvement of Kinyarwanda words since some of them which were included in the IHC content were out of context while others were miss spelt thus making them loose meaning.

5.1.4 Strengths and Limitations

The strength of this study is the use of different data collection methods such as observation methods, focus group discussion, audio recording during interviews, and focus group discussions with the pupils. The finding from each method provided a great ground for supplementation and discussions of the findings to corroborate and make solid the evidences in the study. These evidences could later be used by other researchers in other subsequent studies of a similar nature.

The analysis of the results of this study was carried out using an established framework for user experience, the honeycomb model. The facets of the honeycomb model were well-suited for analyzing the user experience data, making it easier to explore the user experiences in depth, identify problems and reflect on solutions. We did not experience the need to add new facets during the analysis, something which indicates that the framework was suitable for analyzing the scope of data we captured.

Furthermore, the researchers who participated as observers were not part of the team that developed the IHC resources, minimizing the risk of biased reporting.

However, there were also a number of weaknesses in this study. First of all, there was not enough time for the teacher to cover all the activities in the different lessons in the IHC resources sufficiently. The pupils also did not get enough time to ask questions in areas where they experienced difficulties. Also, parents were not involved in the study; their feedback could have also provided additional valuable insight on the relevance of the material of the IHC resources.

In addition, the pilot study was done in only one primary school thus minimizing geographical coverage and making the generalization of the findings of this study difficult since Rwanda as a country has more 2,000 primary schools.

Furthermore, there were very many phases and steps we were supposed to undergo, including ethical clearance from RNEC, permission from the school, teacher, parents and even pupils themselves. The first six lessons were difficult to organize as the scheduled time did not correspond with the actual time. There were delays and time inconsistencies beyond our jurisdiction

5.1.5 Reflexivity

I am a female researcher and the teacher was also female thus working as colleagues without gender bias might have brought this work to getting better results compared to if it were either way. We were able to communicate and connect easily without any problem to do with gender conflict of interest.

In addition, being a Rwandan myself might have made both the teacher and pupils to identify with their own since the language of communication and those in the IHC sources were all in Kinyarwanda. Being one of their own could have influenced their participation in the study because the level of interaction was more fun than expected.

Starting the pilot study was not as exciting as I had thought. However, bracing myself with the fact this is not the first type of study in Rwanda. Most of the findings were clearly derived from observations, user test interviews with the teacher and focus group discussions with the pupils. However, I believe that my presence and that of my colleagues as researchers in the classrooms

during the lessons greatly contributed to better results compared to if we had not been present in the classroom. Probably the teacher could have ignored a number of activities in the lessons.

5.1.6 Quality of the study

Below I describe four criteria that can be used to assess the quality of results of a qualitative study and discuss each in relation to this study: credibility (in preference to internal validity), transferability (in preference to external validity), dependability (in preference to reliability), and confirmability (in preference to objectivity).[62]

Credibility (Internal validity)

Credibility refers to how correct the data are and how their analysis respond to the question of interest. The resources were evaluated through data collected from the end users that it was intended for, that is the teacher and the pupil. The study was inclusive and nonbiased since every participant had equal opportunity. No one was coerced to take part in the study, everybody participated out of free-will, both the teacher and the children signed consent and assent forms respectively. In addition, different methods of data collection were employed (observations and user test interviews), so any weaknesses in one method would likely be rectified by another. Furthermore, the honeycomb framework was used in the analysis of the data.

Transferability (external validity)

Transferability (external validity) is concerned with the extent to which the findings of one study can be applied to other situations. The selected school in Kicukiro district was uniquely located in proximity to the School of Public Health of the College of Medicine and Health Sciences, because it was much easier for us to access compared to other public schools. This study was part of a larger project that included similar pilot testing of the IHC resources in Uganda, Kenya and Norway. We have used the same methods and procedures for the pilots as in these countries, and insufficient time as the major challenge. This testing was done in a ten-week period while conducting ten class observation sessions, ten focus group discussion, and ten user test interviews. Therefore the findings are likely transferable.

Dependability (reliability)

In order to address the dependability issue more directly, the processes within the study should be reported in detail, thereby enabling a future researcher to repeat the work, if not necessarily to

gain the same results. Thus, we have detailed the study process in the methods section, which can be used by anyone else to replicate the pilot test.

Confirmability (objectivity)

Confirmability is dealing with investigators' concern to maintaining objectivity during the study. In this work, the investigators strove for objectiveness in the data collection by using an observation guide to record their observations. This helped assure continuity across the class sessions and minimize individual influence in what was being recorded. The views and opinions of the participants formed the core of the data analysis, not the observations (which were used only to support or help interpret the findings derived from interviews). The findings were coded and the results from three independent observers were compared and a consensus was arrived at.

5.2 CONCLUSION

The use of the IHC resources translated to Kinyarwanda was found to be viable in the Rwandan context. We have learned that it is meaningful collecting suggestions and ideas from participants in order to conceptualize and use IHC resources in the Rwandan context. In fact we found that children and teachers can be helpful in evaluating and revising primary school resources, and they can significantly contribute to the improvement of educational resources that would be gainful for the Ministry of Education.

As regards user experience with the IHC resources, there are still issues with understanding of the content being taught in the IHC resources and aspect of time constraint because of the limited time agreed upon by the research team and the school during the pilot study. However, positive user experiences of the children and teacher wanting such resources and their ease of use due to the translation to Kinyarwanda are steps in the right direction of promoting informed health choices at primary level. This pilot study has demonstrated how the same method could be useful in other pilot studies that target to develop and test primary school resources for Rwanda.

5.3 RECOMMENDATIONS

The study indicated that there was a serious problem of time constraint for both the teachers and the pupils. Therefore it is imperative that in future, the researchers should provide shorter lessons, exercises and activities that include sufficient time for the pupils to ask questions and for

the teachers to explain more to the pupils. This will make the resources more suitable for use in Rwandan school settings.

Furthermore, some minor typing errors were identified in the IHC material; there is need for the future version to be fully proof read before it is finalized and published.

Similarly, some lessons, specifically lesson 7 had no examples. It is therefore necessary that the designers of the next version of IHC material should put into consideration the inclusion of exercises in this lesson. This will increase the interest and desirability to read the material and do its exercises.

In addition, there were instances were some lessons had very few exercises. It is therefore recommended that the designers and the writers of the IHC material should include considerable number of exercises in each lesson so as to promote understandability and usefulness.

Likewise, the IHC material was a pilot test study in only one primary school in Kicukiro district. It would be of great value if more schools from the different districts in Rwanda were involved in future work, for them to appreciate the relevance of this material in promoting good health.

Additionally, primary school leadership should incorporate in their curriculum and health policy, the teaching of informed health choices to their pupils so that they grow up knowing that not every health claim should be relied on without making more consultations from people who are more informed in such health fields.

In addition, parents should be flexible in allowing their children to participate in the testing of school related materials. Since their participation is for the common good for the successful implementation of such material.

Furthermore, Honeycomb has been found to be a great instrument for testing school materials. Thus future primary school material in any field be it literacy, health, or curriculum design could successfully make use of Honeycomb framework to test the materials before dissemination.

Moreover, future testing of any learning material in primary schools should involve the participation of the people it affects directly and indirectly such as parents, district education officers from the ministry of education, the media and other educational stakeholders.

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APPENDICES

APPENDIX A: INFORMED CONSENT FOR TEACHERS

Supporting Informed Healthcare Choices in Low-Income Countries

Research participant informed consent form in English **(adult)**

- **INTRODUCTION.**

The Supporting Informed Healthcare Choices in Low-Income Countries (SIHCLIC) Project is a research collaboration that seeks to improve health literacy by developing and testing of resources that can be used by the public to appraise health information.

In Rwanda, the study is being conducted by researchers from University of Rwanda College of Medicine and Health Sciences and will involve continuous interaction with journalists, teachers and children.

The information in this document is meant to help you decide whether or not to take part in this study but first there a few things to note.

- You are being asked to participate in this research because you are a journalist/media practitioner or teacher or a potential recipient of information from journalists/media practitioners or teachers; and an adult of legal consenting age.
- We anticipate that once you agree to participate you will be in the study for a period of 5 years or less.
- You will be offered a copy of this form for your future reference.
- Please feel free to ask if you have any questions or concerns at any time before the start or during the conduct of the research.

- **WHY IS THIS RESEARCH BEING CONDUCTED?**

The aim of this collaborative research project is to improve population health outcomes by improving health literacy in low-income countries. We will do this by developing and evaluating two strategies for improving health literacy: development and evaluation of mass media

resources for the general public and the development and evaluation of teaching resources for school children.

- **HOW WILL THE STUDY BE CONDUCTED?**

This project will be implemented using two strategies for improving health literacy:

i) The development of mass media resources to improve the ability of the general public to understand and appraise information about the effects of health care.

ii) The development of teaching resources for school children to improve their ability to appraise and use information about the effects of health care services/interventions made available to them.

These strategies will be evaluated in two community trials testing the effectiveness of the developed resources in improving health literacy among the target audiences for teachers and mass media practitioners/journalists.

The Research project will be conducted under 3 different phases, one following the other.

- Phase one will include: **Priority setting and stakeholder involvement**.
- The second phase will focus on **Resource development and user testing**.
- Phase three will concentrate on **Evaluation of the resources** developed.

- **POSSIBLE RISKS TO YOU:**

We anticipate that your participation in the study/research presents no risk to you as an individual. However, participation in this study might in some way interfere with your work if you are required to participate in study activities during work hours.

- **POSSIBLE BENEFITS TO YOU.**

There will be no direct benefit to you from participating in this study and there isno promise of gaining any material or financial benefit from the project currently or in the future.

Your participation in the study could contribute to gaining new knowledge that will be used to design resources aimed at improving population health outcomes by improving health literacy in low-income countries. You will be equipped with skills to enable you obtain, process and understand health information that you need to make appropriate healthcare decisions. You will benefit from free health information.

- **COST TO THE PARTICIPANT.**

You will incur no cost whatsoever other than time as a result of taking part in the study.

- **COMPENSATION.**

You will not gain any form of compensation, monetary or otherwise for participating in the study but appropriate daily expenses in form of lunch and transport will be reimbursed if you attend any studyrelated meetings or workshops.

- **CONFIDENTIALITY.**

The information you give during the conduct of this research will be kept confidential in accordance to the ethical standards agreed upon by the local and international organizations governing the conduct of research involving human participants.

Any information resulting from this study, if published in scientific journals or presented at scientific meetings, will not reveal your identity.

- **RIGHT TO REFUSE/WITHDRAW.**

Your participation in this research is purely voluntary and you are free to decline to take part or withdraw at anytime without any repercussions.

- **QUESTIONS ABOUT THE RESEARCH**

In case of any further questions, please contact **Dr. Laetitia NYIRAZINYOYE**, the Principal Investigator at University of Rwanda College of Medicine and Health Sciences, Kigali Rwanda: **Tel: 0788683209 or Mr. Michael MUGISHA, the Co-Principal Investigator on 0788596947.**

In case of questions in regards to research ethics, you may contact **Dr. Jean Baptiste MAZARATI** on tel: **0788 309 807**, Chairperson, Rwanda National Ethics Committee. Or Valentine INGABIRE the RNEC Adminstrator on tel: **0788 592 004**.

- **DECLARATION OF CONSENT**

The information about this study has been availed and explained to me and all my questions have been answered. I have read this form and I feel that I have had enough information and time to consider my decision to join the study. I fully understand that by signing this form, I do not waive any of my legal rights, nor does it relieve the study investigators their duty (liability), but merely indicates that I have been informed about the research study in which I am voluntarily agreeing to take part. A copy of this form will be availed to me.

Having understood all the information pertaining to this study I therefore agree to my participation in this study by appending my signature and name below.

Research Participant Name: _____	 Signature: _____
Date: _____	Tel number: _____

APPENDIX B: ASSENT FORM FOR CHILDREN

Research participant informed assent form in English (children)

Introduction.
We are doing a research study about how people can be helped to understand and assess information that concerns their health. A research study is a way to learn more about people, how they live their lives and how they make decisions about their lives and what happens to them when they make decisions.

We are asking you to participate in this study because we think that your contribution will help us develop materials that can help children like you understand and assess information about their health.

First of all, there are some things about this study you should know.
Participation in this study is purely voluntary and you may feel free not to join or to stop participating if you feel uncomfortable with the study activities at any time after joining. Your parents/guardians know about this study. If you do not want to be in this research study, you will not be penalized.

If you decide that you want to be part of this study, we may follow how you learn IHC books for up to 5 weeks, four hours per week. During this time we may give you or your teacher some of the materials we shall develop and then ask you some questions at different time points to find out if the materials helped you understand and assess health information or not.
Benefits to you.
There will be no direct benefits to you but we think that by participating in this study but you will receive free health information.

Possible risks to you.
We do not anticipate the study to cause you any harm, risks or dangers. We do not think that your school performance will be affected by participating in this research.

Confidentiality.
If you choose to participate all the information you give us will be kept as a secret and it will not bear your name or your parent/guardian's name.

When we are finished with this study we will write a report about what was learned. This report will not include your name or that you were in the study.

If you have understood everything about the study and all your questions have been answered, and you decide you want to be in this study, please sign your name below. But if you don't want to be in the study it is still ok, don't sign this paper. Signing below means that you have understood, and you are willing to join the study.

Study Participant
Your signature: _____ Date_____

Your name: _____ Date _____

Staff obtaining assent
Signature of person obtaining assent: _____ Date _____

Printed name of person obtaining assent: _____ Date _____

Witness
Signature of Witness: _____ Date _____

Printed name of Witness: _____ Date _____

APPENDIX C: CONSENT FORM FOR PARENT/GUARDIAN

Research participant informed consent form in English (parent/guardian)

- **INTRODUCTION.**

The Supporting Informed Healthcare Choices in Low-Income Countries (SIHCLIC) Project is a research collaboration that seeks to improve health literacy by developing and testing of resources that can be used by the public to appraise health information.
In Rwanda, the study is being conducted by researchers from University of Rwanda College of Medicine and Health Sciences and will involve continuous interaction with journalists, teachers and children.
Your child has been identified as one of the children that can participate in this study however; he/she alone cannot decide by themselves since he/she has not yet reached the legal age of consent for Rwanda. We are therefore seeking permission for your child to participate in this study.
The information in this document is meant to help you to voluntary decide whether or not your child should take part in this study. For your child to participate in this study is purely voluntary, but first there a few things to note:

- **HOW WILL THE STUDY BE CONDUCTED?**

The project has developed books for children and teachers to learn about informed health choices. A science teacher in the school of your child will teach children the content of the books with help from teacher's guide. Your child will have his/her copy of children's book. UR-CMHS-SPH researchers will observe how the teacher is teaching lessons in the class. They will take notes on how the lesson was conducted. After each lesson, few selected children will be interviewed to share their experience of using that book. Then the teacher will also be interviewed to share his/her experience to use those books. All the interviews with children and the teacher will be recorded and where possible some photos for class or groups will be taken to ensure that researchers would not miss important information that would help to improve school resources.

- **POSSIBLE BENEFITS AND RISKS TO YOUR CHILD:**

Your child will benefit learning health related information that would help them to make better decisions in present and future. He/she will also be among children from low-income countries to contribute their ideas in developing effective books that will help other children in the world.

We anticipate that your child's participation in the study/research presents no risk to him/her as an individual. Your child's participation in the study will not affect his/her performance at school.

COMPENSATION AND COST TO THE PARTICIPANT.

You will incur no cost whatsoever as a result of your child taking part in the study. Your child or you will not gain any form of compensation, monetary or otherwise for participating in the study. However participation in the study will impart your child with knowledge and skills to assess claims.

- **CONFIDENTIALITY**

The information your child may give during the conduct of this research will be kept confidential in accordance to the ethical standards agreed upon by the local and international organizations governing the conduct of research involving human participants.

Any information resulting from this study, if published in scientific journals or presented at scientific meetings, will not reveal your child's identity.

- **QUESTIONS ABOUT THE RESEARCH**

In case of any further questions, please contact **Dr. Laetitia NYIRAZINYOYE**, the Principal Investigator at University of Rwanda, College of Medicine and Health Sciences, School of Public Health, Kigali Rwanda Tel: **0788683209 or Michael MUGISHA, the Co-investigator on 0788596947**.

In case of questions in regards to research ethics, you may contact **Dr Jean Baptiste MAZARATI** on tel: **0788 309 807**, Chairperson, Rwanda National Ethics Committee. Or Valentine INGABIRE a permanent staff on tel: **0788 592 004**.

- **DECLARATION OF CONSENT**

The information about this study has been availed and explained to me and all my questions have been answered. I have read this form and I feel that I have had enough information and time to consider my decision to allow my child participate in the study. A copy of this form will be availed to me.

Having understood all the information pertaining to this study I therefore agree to my child's participation in this study by appending my signature and name below.

Research Participant's Parent/Guardian Name:_____	Signature: _____
Date: _____	Tel. number: _____

APPENDIX D: OBSERVATION FORM

The goal of all testing is to be as sure as possible that the final version of the resources will be effective--that people will understand what we want to teach them--when used in the trial, next year.

SECTION A: Pre-lesson

Observer:

Date:

School:

Scheduled start time of lesson:

Scheduled end time of lesson:

Number of children:

Age range of children:

From youngest to oldest child.

Number of benches:

This is so we know about how much space each child had.

Number of teachers in the room:

SECTION B: Start of lesson

Actual start time of lesson:

Do not let teacher or children know you are timing lesson.

What did the teacher do before the class started reading the chapter? For how long?

E.g. make jokes, ask questions or answer question

SECTION C: Reading

Follow along in the guide, so you can note how the teacher uses and understands instructions, e.g. whether the teacher misunderstands or skips any.

Note things like:

- *What the children and teacher misunderstand, e.g. a picture, an example or an exercise*
- *What words the teacher and children struggle with*
- *What examples the children and teacher use, other than those in the book*
- *What that the children and teacher seem to like especially*
- *Anything else that you think is important for the book's effect*

Remember to note things like:

- *How the teacher uses and understands instructions*
- *What the children and teacher misunderstand, e.g. a picture, an example or an exercise*
- *What words the teacher and children struggle to pronounce*
- *What examples the children and teacher use, other than those in the book*
- *What the children and teacher seem to like especially*
- *Anything else that you think is important for the book's effect*

Page X--[Part of guide]

[Extra question]

SECTION D: Activity

SECTION E: Exercises

If the they do not spend time on exercises during the lesson, skip this section.

SECTION F: Post-lesson

Who read aloud?

Was it all the children together, one child at a time, the teacher or some combination?

Actual end time of class:

When did the teacher leave the children to work on their own or do other things?

About how long did the class spend reading the story?

About how long did the class spend doing the activity?

About how long did the class spend doing exercises with the teacher in the room?

About how long did the children break for?

Did the children seem interested or disinterested in the lesson? How so?

How did the teacher engage the children?

How did the teacher use the blackboard?

What did the children do with the books at the end of class?

Did they take them home or hand them in?

APPENDIX E: CHILDREN'S BOOK INTERVIEW GUIDE

The goal of all testing is to be as sure as possible that the final version of the resources will be effective--that people will understand what we want to teach them--when used in the trial, next year.

SECTION A: Pre-interview

Interviewer:

Observer:

Date:

School:

Interview subject(s):

Write their code--e.g. child001--not their name.

If they have been interviewed before, use the same code as last time.

Gender:

Was interview after a pilot lesson?

SECTION B: Introduction

Start time:

Briefly introduce yourself.

Tell them that we want to help people making choices that matter to their health.

Tell them that:

- *They are testing what we have made.*

- *We are not testing them.*
- *We think the resources can be better.*
- *The resources are for someone like them.*
- *Their thoughts can help us make the resources better.*
- *There are no wrong answers to our questions.*

Tell them that the interview will last less than an hour.

Remind them that they are free to leave at any time.

Tell them that:

- *We want to record the interview so we can be sure of what they said.*
- *We will not attach their names to the notes or recording.*

Ask if they have any questions.

Make sure they have understood and signed all necessary consent forms

Start recording if they approve.

SECTION C: Profile

If you have interviewed the same person before, skip this section.

How old are you?
What year of school are you in?

SECTION D: Think-aloud

They should only read aloud if they want.

For each part of the book, ask how they think it could be easier to use and understand.

Use questions like:

- *What do you think this part is about?*
- *What is difficult to understand? Why?*
- *What should be improved? How?*
- *What should there be more of? Why?*

Remember: ask how they think the book could be easier to use and understand;

- *What do you think this part is about?*
- *What is difficult to understand? Why?*
- *What should be improved? How?*
- *What should there be more of? Why?*

Page X--[Part of book]

[Extra question about this part]

Page X--Activity

Page X--Exercise X

Is it a familiar type of exercise?

SECTION E: General

What questions do you have about what John and Julie learn in this chapter?

Do you trust what is in this chapter? Why?

After reading this chapter, do you think the book is for a class like yours? Why?

How would you explain to a friend what John and Julie learn in this chapter?

How do you think what John and Julie learn fits in your life?

Do you think the chapter is interesting and important? Why?

Do you think the people at your home would be interested in the book? Why?

Do you have anything more you want to say to us about the book or project?

SECTION G: Observer's questions

The observer asks whatever questions they have.

SECTION H: Interview experience

Is there anything we could have done to make the interview a better experience for you?

Stop recording and thank them.

SECTION I: Post-interview discussion

What were the most important findings?

What do the findings suggest we should do for the resources to be effective.

Enter findings and transcribe the interview recording as soon as possible.

APPENDIX B3: TEACHER'S GUIDE INTERVIEW FORM

SECTION A: Pre-interview

Interviewer:

Observer:

Date:

School:

Interview subject(s):

Write their code--e.g. teacher001--not their name.

If they have been interviewed before, use the same code as last time.

Gender:

Was interview after a pilot lesson?

SECTION B: Introduction

Start time:

Briefly introduce yourself.

Tell them that we want to help people making choices that matter to their health.

Tell them that:

- *They are testing what we have made.*
- *We are not testing them.*
- *We think the resources can be better.*
- *The resources are for someone like them.*
- *Their thoughts can help us make the resources better.*
- *There are no wrong answers to our questions.*

Tell them that the interview will last less than an hour.

Remind them that they are free to leave at any time.

Tell them that:

- *We want to record the interview so we can be sure of what they said.*
- *We will not attach their names to the notes or recording.*

Ask if they have any questions.

Make sure they have understood and signed all necessary consent forms

Start recording if they approve.

SECTION C: Profile

If you have interviewed the same person before, skip this section.

Tell them:

- *We want the resources to be used and understood by people with different backgrounds.*
- *For example, we want them to be easy to use for people of different ages.*

Remind them that their names will not be attached to anything they say.

How old are you?

What is your level of education?

How long have you taught?

What subjects have you taught?

E.g. science.

What years have you taught?

E.g. year five, primary school.

SECTION D: Think-aloud

Ask them to:

- *Put the guide on the table.*
- *Think aloud as they read it page by page.*
- *Circle any unfamiliar words or words that they think would be unfamiliar to the children.*

They should only read aloud if they want.

For each part of the resources, ask how they think it could be easier to use and understand.

Use questions like:

- *What do you think this part is about?*
- *What is difficult to understand? Why?*
- *What should be improved? How?*
- *What should there be more of? Why?*

Remember: ask how they think the book could be easier to use and understand;

- *What do you think this part is about?*
- *What is difficult to understand? Why?*
- *What should be improved? How?*
- *What should there be more of? Why?*

Page X--[Part of guide]

[Extra question about this part]

Page X--Activity

Page X--Exercise X

Is it a familiar type of exercise

SECTION E: General

What is missing to help you answer any questions from the children?

E.g. details or examples.

Do you trust what is in this chapter? Why?

After reading this chapter, do you think book is for a class like yours? Why?

How would you explain the lesson goals to a colleague in your own words?

What examples of your own would you use?

How do you think the lesson goals apply to your own life and the children's lives?

Do you think the chapter is interesting and important? Why?

Do you have anything more you want to say to us about the book, guide or project?

SECTION G: Observer's questions

The observer asks whatever questions they have.

SECTION H: Interview experience

Is there anything we could have done to make the interview a better experience for you?

Stop recording and thank them.

SECTION I: Post-interview discussion

What were the most important findings?

What do the findings suggest we should do for the resources to be effective.

Enter findings and transcribe the interview recording as soon as possible.

APPENDIX F: BARRIER AND FACILITATOR FRAMEWORK FOR TEACHING RESOURCES

Table 3: Adjusted set of seriousness codes for rating barriers and facilitators findings

Category	Description	Code
Major barrier	A barrier that will prevent effective use or implementation in schools in Rwanda	XXX
Barrier	A barrier that will probably prevent effective use or implementation in schools in Rwanda	xx
Minor barrier	A barrier that might prevent effective use or implementation in schools in Rwanda	X
Major facilitator	A facilitator that will promote effective use or implementation in schools in Rwanda	000
Facilitator	A facilitator that will probably promote effective or implementation in schools in Rwanda	00
Minor facilitator	A facilitator that might help promote effective use or implementation in schools in Rwanda	0

Table 4: Barriers and Facilitators as User Experience in IHC Resources

Category	Description
Major barrier	• As we teach other lessons during 40 minutes, these lessons are very long. • The exercise of asking questions took a lot of time because it was done in groups (benches), and every group was writing on the blackboard the answer.
Barrier	The only thing I realized in this lesson 7 is that there are no examples, not even a single one. I asked the children to give their own examples but it was hard for them….this chapter 7 was difficult for them to understand. There were 3 comparisons of 10 people followed by 3 comparisons of 100 people and it was like too much for them, so hard for them to clarify the different results.
Minor barrier	The teacher doesn't go through all activities, she summarizes during the time of reviewing in the last lesson.
Major facilitator	• This book is telling us what to do in order to take care of our lives, what to avoid which may be harmful for us, and this is important for all of us, parents and children alike. • It can help our family members because it also helped us, we are no longer acting abruptly when we hear what people are claiming; we come and ask the teacher for more explanations.
Facilitator	This book is fitting P5 children and I would recommend that it is supplied to other P5 children of other schools so that they know how to make health choices about treatments and health in order to avoid bad effects.
Minor facilitator	This book can be helpful for anyone because it teaches people to first think on what they are going to do or on what they are told; the importance of thinking carefully before acting, it may be very important for them. They can learn a lot from the book.