

Analysis and Implementation of Goal-Directed Design in Reproductive Health Learning Media for High School Student Case Study: Mitra Citra Remaja (MCR)

David Meulana Abidin¹, Danang Junaedi², and Indra Lukmana Sardi^{1,*}

¹Telkom University, School of Computing, Informatics Department, Jl. Telkomunikasi Bandung, Indonesia

²Telkom University, School of Computing, Information Technology Department, Jl. Telkomunikasi Bandung, Indonesia

Abstract. MCR as a non-governmental organization focused on providing education and other supporting activities related to reproductive health education issues to high school students. However, the efforts that have been done still get less satisfied feedback from students, because they have not been able to deliver thoroughly. This is due to the inadequate facilities used especially for a large number of participants in the school who visited and the number of MCR volunteers are limited so that the extension only covers the city of Bandung. In addition, there is no regular schedule that can be used for extension activities. Thus, it takes an internet-based learning media that creates independent learning process and without limitation of space and time. One important aspect of the development of learning media is the usability that is closely related to the user interface. The approach used for designing user interface model is by using goal-directed design method. Begin by identifying user objectives and behaviours and translating into user models of learning media of reproductive health. We have tested usability with QUIM parameters of user interface model generated through goal-directed design implementation, which reaches average usability percentage more than 85%, so it can be said to comply usability element with a very good category.

1 Introduction

Reproductive health education is an effort to teach and awareness about the physical, mental, and social health, not only free from disease or disability, but also related to reproduction system, function, and process in order to avoid sexual behaviour [1]. Based on the 2012 SDKI survey, 12,853 teenagers 15-19 years old of 19,399 15-24 year-olds agreed to pre-marital sexual attitudes [2]. From these data, further treatment is needed to reduce the occurrence of sexual behavior in adolescents, especially high school. MCR is an organization under the auspices of PKBI institutions, which aims to deliver reproductive health education to high school adolescents equal to the city of Bandung. So far, the effort of delivering reproductive health education is done by counseling and other supporting activities, which get enthusiastic response from high school students while following the activities undertaken.

However, based on the MCR evaluation after each activity, getting feedback dissatisfied from high school teenagers related to the delivery of information that has not been adequately conveyed thoroughly. This is due to the extension facilities, which are insufficient to convey information to a large number of participants at the school attended. In addition, reproductive health counseling requires scheduled time at least once a week. Limitations of MCR members also because extension cannot meet the coverage area of Bandung. So that

required additional tools in the form of internet-based learning media that is not limited space and time and can create independent learning process [3].

Keep in mind to developing Internet-based learning media should pay attention to the usability element to facilitate the user when using it [3]. One important aspect that must be considered from usability is user interface which is a bridge between human interaction with an application or media [4]. Therefore, it is necessary to design the appropriate user interface design and in accordance with the user's purpose. This goal can be achieved by identifying the character and needs of users and stakeholders related to learning media to be built.

So, Goal-Directed Design is implemented by identifying user objectives and behaviors and translating into user interface model of learning media on reproductive health [4]. The system user interface model that has been generated, will be evaluated to assess user satisfaction based on usability [5][6]. The results from Harkirat Kaur Padma and Abdoasslam Hatab M Katy [7], Quality in Use Integrated Measurement (QUIM) can evaluate Goal-Directed Design implementation results and user interface models of all types of software, especially those with many deficiencies such as software to build a complete framework of 10 usability factors according to the assessment parameters for research purposes.

* Corresponding author: indraluk@telkomuniversity.ac.id

2 Goal-directed design and research methods

Goal-Directed Design is a design method of user interface design based on user goals that can later be implemented into a product or application [4]. Goal-Directed Design focuses on how to design user interface models by identifying the needs of a product design or a behaviour-based application in order to achieve both user and stakeholder objectives. The following is the implementation of Goal-Directed Design method illustrated in Fig. 1 which is the stages of the Goal-Directed Design method.

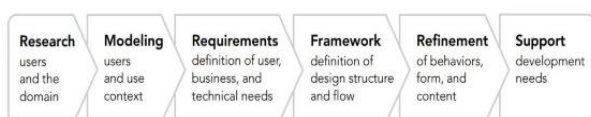


Fig. 1 Goal-directed design [4].

2.1 Research

Stages of collecting qualitative data about real potential users, as well as stakeholders for collection by interview method as needed. Research stages are done by interview method to 30 high school students as prospective users and research scope, with sample selection using random sample technique in groups, because the nature of the population is divided into several groups (sub-district) in accordance with the characteristics of Bandung. In addition, interviews were also conducted with MCR counselors as stakeholders of 3 people. This stage will produce qualitative data in the form of interview conclusions from potential users and stakeholders, describing the characteristics, needs, goals, and motivation of users and stakeholders in the learning process about reproductive health. Thus, it can be used to build a persona at the modeling stage, which previously builds the persona first of all identifying the organization goals of the stakeholder interview results.

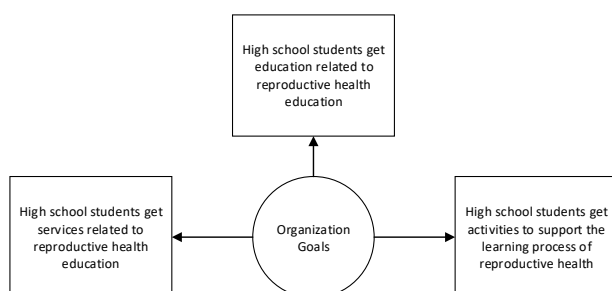


Fig. 2. Organizational goals.

2.2 Modelling

In this stage, modeling of the results obtained at the stage of research, as well as an input at this stage. Thus, resulting in the output of the persona of the prospective user, which in persona there is some inherent information that is demographic, device and platform,

expertise, activity, behaviour, goal & motivation, and action to achieve goals. In addition to persona at this stage is also done modeling of the user interaction with the environment described in the form of workflows, to achieve goals in the process of learning about reproductive health.

2.3 Requirements

At this stage, the process of preparing user needs on reproduction health learning media based on user goals and stakeholders of the goals contained in the user persona and organization goals. Then, described in the form of user persona needs, context scenarios, task analysis with Hierarchical Task Analysis (HTA) [9] and conceptual model. The requirements generated at this stage are the tasks required by the user on reproduction health learning media contained in the conceptual model, such as reading MCR profile, account registration, login, reproductive health study, reproduction health discussion forum, accessing supporting activity information, and log out.

2.4 Framework

After the conceptual model is formed, then the design is done in the form of wireframes by compiling an interaction framework or interaction framework. Interaction framework will describe the display structure and layout of each page of reproduction health media for high school students equal. Framework stage through several processes that will get the end result of wireframe along with an explanation of the visual elements contained in each page, which adjusted the basic principles of website design [10][11]. Because of the needs of user persona who used to do the learning process with the utilization of the internet using the website. The wireframe generated at this stage is a homepage wireframe to convey MCR profile information, account registration, login, reproductive health study, discussion forum topics, reproductive health discussion forums and activity information.

2.5 Refinement

After forming wireframe, then the next is made a visual style based on the wireframe and visual element at framework stage. Visual styles are created in the form of user interface design based on the user's goals, with the conclusion that the user wants a simple or simple design, spacious, able to convey website content, neatly easy to read, modern as well as soft color selection. The needs of user persona are used as a reference in the design of user interface that takes into account some elements of color, typeface and typography and icons.

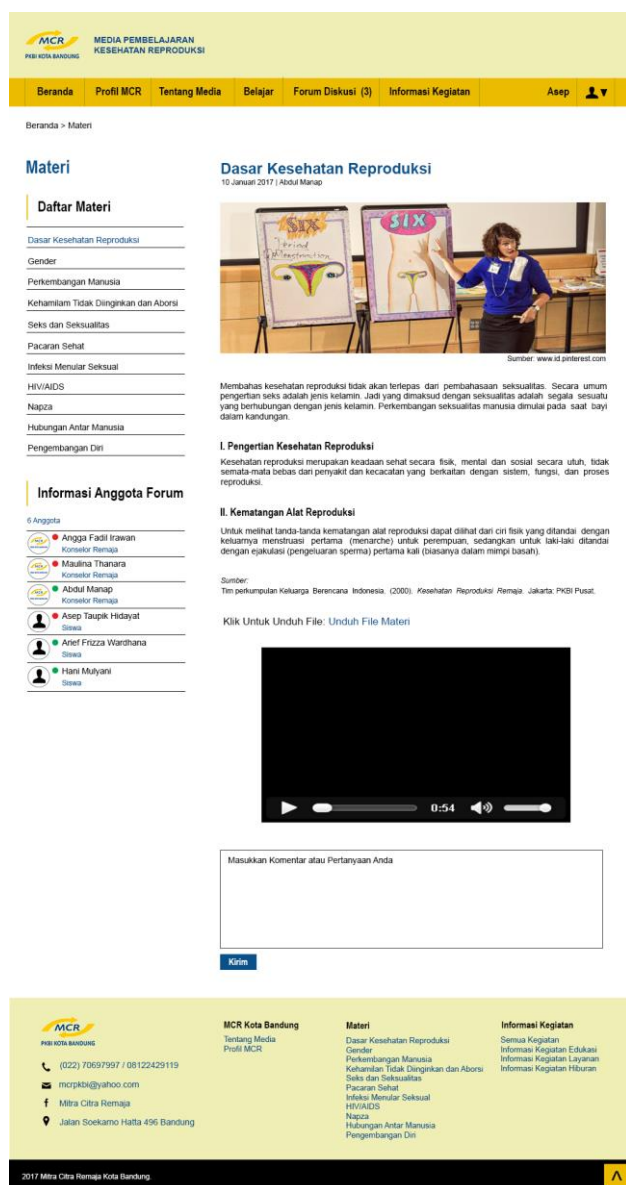


Fig. 3. Sampe of the user interface design.

2.6 Support

At this stage, the user interface design that has been generated at the refinement stage is implemented into a system prototype in accordance with the case study on the research conducted. Prototype created using PHP Programming Language and MySQL Database. Thus, produce reproductive health learning media which will then be done usability testing of the resulting prototype.

2.7 Evaluation of requirements

We use Quality of Use Integrated Measurement (QUIM) method. QUIM to measure actual usage and identified a problem in software [12]. QUIM consists of 10 factors such as efficiency, effectiveness, productivity, satisfaction, learnability, safety, trustfulness, accessibility, universality, and usefulness.

We set the percentage criterion for a range value. The range value is obtained from the largest percentage value

reduced by the smallest percentage value divided by the number of measurement scales. Following is the result in Table 1.

Table 1. Criteria range value of evaluation.

Interval	Percentage Category
85% - 100%	Excellent
69% - 84%	Good
53% - 68%	Adequate
37% - 52%	Deficient
20% - 36%	Poorly

The QUIM percentage for user evaluation on children as follows in Fig 2:

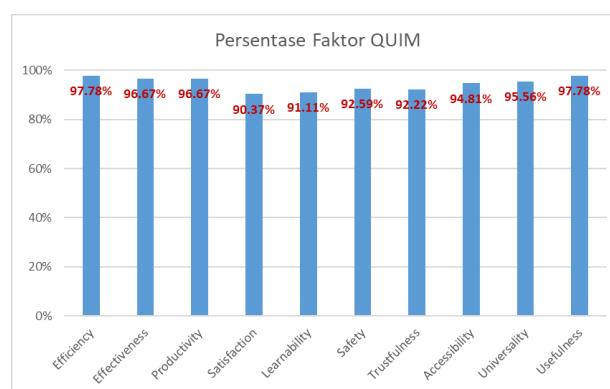


Fig. 4. QUIM percentage factor.

Based on the results of data processing, the size of each factor obtained has reached the usability value of more than 85% with a very good category with an average value of 94.56%, which means it has achieved user satisfaction in using health change media learning.

Referring users with user interface display on instructional media that get respond from respondent after doing testing, stating that current learning media still less from the side of modernization. Because the modernization of this learning media only creates content by using asymmetric equilibrium theory. Meanwhile, the side of modernization can be highlighted also in terms of color and typography, thus further improving user satisfaction with the display of learning media.

Refers to users who want to interact with the learning media such as interaction flow, icons, and menus available. Get responses from respondents after responding to a user, stating that icons on many buttons are not yet compatible with their use, except for unused buttons that are different from the selected number when the cursor is on the user's intended button.

3 Conclusion

From the results of the analysis, implementation and testing of usability done on modeling user interface on reproductive health learning media for Senior High School equivalent can be drawn conclusion that is:

First, in the development of reproductive health learning media, there are goals that are divided into

organizational goals and user persona obtained based on interviews to 33 respondents (30 students of Senior High School in Bandung and 3 teen counselors MCR Bandung). By using the method of Goal-Directed Design which can produce user interface model of learning media of reproduction health in website form based on the basic principle of website design. The website has a task in accordance with both goals are reading MCR profile, log in as well as account registration, learning reproduction health as well as contact information of each registered forum member, discussion forum, and access activity information compiled using scenario context. To be able to achieve both goals, previously through 6 stages of Research, Modeling, Requirement, Framework, Refinement, and Support.

Second, Using the Quality in Use Integrated Measurement (QUIM) method the usability level of the user interface model can be measured, based on user category of high school student personnel with the number of respondents as many as 9 people on the user interface design testing, which earned an average of 94.56% with very usability category good. Thus, the test is only done one-time iteration because it has reached the percentage of 85%. By using the method of Goal-Directed Design is produced user interface design of reproduction health media that meets usability element.

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