Article

Audio Visual Aid's Development of Health Promotion Media With Design Thinking at Nutrition Care Center

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Abstract:
Teaching Factory Nutrition Care Center (NCC) is a synergistic product of the Jember State Polytechnic and the world of business and industry (DUDI). The development of NCC supports student practice learning in conducting nutrition interventions. The research aims to develop an efficient and attractive NCC-promotive educational media. This research is a Research and Development (R&D) with the approach that is used design thinking. It requires a designer to be able to analyze a problem, express creative ideas, experiment in making a prototype, to collect the proper feedback regarding the media created. The study results show that the audio-visual media that will be developed are the NCC mascot, profile videos, and nutrition education videos. Through the ideate and prototype stages are an egg mascot called Si Nucca, an acronym for the Nutrition Care Center. The character of eggs describes foods with high nutritional value and are affordable by the community. The results of media validation by the material and media validators got good results (score of 4.7). Acceptance test results show a score of 4.47 with a good interpretation on the aspects of effectiveness, attractiveness and efficiency. The conclusion is that the audio-visual media that has been developed is feasible to be tested on the public.

Keywords: Design Thinking, Health Promotion, Audiovisual Aid, Nutrition Care Center

1. Introduction

The synergy of Vocational Universities with the Business and Industrial World (DUDI) is expected to be the main capital for the development of quality human resources of the nation and is supported by the development of modern technology in the 5.0 era. Politeknik Negeri Jember as a Vocational University is obliged to create synergy so that the goal of link and match can be achieved.

Clinical Nutrition Study Program, Department of Health at the Jember State Polytechnic, is study programs that continue to innovate in the practice of the Tridarma of Higher Education to produce quality graduates in the field of health services (Care Service). The quality and competitiveness of graduates are determined from the development of a form of learning that links and matches with DUDI in order to bring students closer to the real work environment so that the competence of students to become superior nutritionists can be achieved. Teaching Factory (TeFa) Nutrition Care Center (NCC) has growing potential into a complete Nutrition Service Center. The development of NCC continues to support student practice learning and community services in the

form of assessment and diagnosis of nutritional problems, counseling and nutritional interventions according to client needs. Based on the results of the potential analysis, NCC already has a practice land, nutrition assessment tools, nutritionists and nutriforce teams from students.

The results of interviews with the NCC management team, since it has launched and operated in January 2022, it had been found that the visit rate decreased by 80% and 85% of visitors are from Jember State Polytechnic staff. This shows that NCC services still need to be improved both in management and in infrastructure, especially health promotion media as a means of delivering messages of educational nutrition services that are informative for clients and the wider community, but still have character.

Health messages and information are easier to convey nutrition communicators through health promotion media so that they can increase knowledge, and attitudes that lead to behavior change[1], [2], [3]. Several types of media in the form of print, outdoor and electronic media[4], [5].

The development of NCC health promotion media needs to be in line with the internet or online based media as the developments in information technology. Currently, NCC has only a poster as media promotion and it has not been able to provide comprehensive information, the delivery of messages that are still partial and not characteristically specific according to the needs of the target, so it is necessary to develop innovative and modern health promotion media, such as media based on visual motion, virtual reality / augmentation reality, audio and audiovisual with character strengthening to more effectively persuade target[6].

Design Thinking is an interactive process to understand users, challenge assumptions, and redefine problems to identify alternative strategies and solutions that may not be immediately apparent with the initial level of our understanding. At the same time, Design Thinking provides a solution-based approach to solving problems. It is a way of thinking and working as well as a collection of direct methods. Design Thinking is very useful in overcoming obscure or unfamiliar problems by reframing problems in human-centered ways, creating many ideas in brainstorming, and adopting a direct approach in prototype making and testing[7]. Design Thinking judges that people facing a problem is the person holding the answer key from their problems, so it is very necessary to understand the principles of design thinking to help resolve problems[8].

The research problem formulation focuses on meeting the needs for AVA (Audiovisual Aids) health promotion media and strengthening the character of NCC by creating educational mascots which are currently the main need in modern promotion, education and nutrition services. This need gave rise to the researcher's idea considering the need for NCC to brand its identity as the only nutrition service center in Jember. This research aims to develop efficient NCC promotional and educational media and attract public awareness by creating a character education mascot.

2. Materials and Methods

The research is a Research and Development (R&D) uses a series of methods to analyze potential, develop designs, test and create products on NCC. R&D is a research method to develop new products or improve existing products. There are various research models that can be used as references in this Research and Development research, including the Borg and Gall Development Model, 4D Model, ADDIE, and Design Thinking. Design thinking is an approach to developing a new product by viewing customers as the main focus point in solution development. Design thinking combines diverse perspectives by using brainstorming and prototyping methods to understand customer needs, challenges and preferences so that companies can create products and services that are relevant and satisfying.
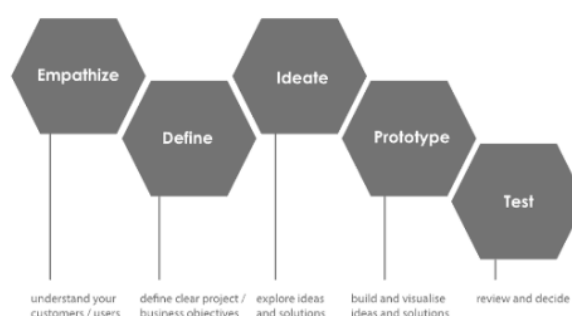
Figure 1. Design Thinking Process (Ling, 2015)

This research was conducted at the Jember State Polytechnic including the NCC laboratory, and the Smart Multimedia Laboratory (MMC) from 20 June to 1 September 2022. It uses 32 research subjects consisting of 10 NCC managers, two validators and 20 new students taken by purposive sampling from 2825 students. The research instruments used in this study were Explanation before Consent (PSP), informed consent, media assessment questionnaire, and interview guidelines. Analysis of quantitative data using a Likert scale[9].

3. Results and Discussion

This research was developed through five stages of design thinking, namely:

Stage 1: Emphatize

First, the design thinking stage is to determine and understand the emotions, experiences and situations of the user. In order to truly understand the needs of users, developers shall experience or act as users through interviews and observations. In this process, the research team will carry out an interview process as well as a Focus Group Discussion (FGD) with the NCC management. The research team will dig up a variety of information, including media and what promotional content is most needed.

The Empathize stage was carried out through FGD with several speakers, namely the Head of the Health Department, the Head of NCC, the Nutrition Counselor, Practical Students and NCC Users. The overall speakers were 13 people with an FGD duration of 3 hours. The FGD Guidelines carried out are as follows:

Table 1. Point of Discussion Focus Group Disscusion (FGD) Development of Health Promotion Media Prototype

No	Questions
	Opening: Research Brainstorming, Research Objectives and Design Thinking Health Promotion Media for NCC, Outcomes in the form of AVA Media and NCC Mascots, Output Benefits.
I	**About NCC**
	What is the background from establishment of the NCC? Probing: What is the purpose?
	What are the main activities of the NCC, both planned and implemented?
	Does NCC give benefit to internal and external users?
	What services that needs support of health promotion education media support?
	Is health promotion media useful for NCC? **Probing**: Why? What do you think about it?
II	**AVA Media (Audiovisual Aids) Health Promotion**
	Brainstorming: Video Sample Playback
	What do you think about the video?

No	Questions
	Probing: What is the video about and what is the benefit after watching the video?
	Do you know what health promotion is? **Probing:** What is the purpose of doing health promotion? In your opinion, what are the health promotion efforts/strategies?
	Do you know what AVA Health Promotion media is?
	Generally, what is your perception when you hear about health education shows with AVA media?
	What components need to be in the NCC Health Promotion AVA media?
	What is the main message in the AVA NCC media?
	Is there a behavior change goal with the NCC Health Promotion AVA media? Probing: What is the expected behavior?
	Based on the urgency of the health message emphasis, write minimum 3 priorities from 1-3 regarding health problems!. **Probing**: Is there any specific reason for these health problems?
	What are the future development plans for NCC? **Probing**: How can AVA Media support this plan?
III	**NCC Mascot**
	Brainstorming: Mascot Sample Display
	Do you think the NCC Mascot can increase the value of NCC? Probing: what values need to be highlighted on the NCC Mascot
	In your opinion. How the image of NCC mascot, can make the NCC users remember it easily? **Probing**: What kind of character that NCC mascot shall have?
	What gender and color that match with NCC Mascot?

The Focus Group Discussion resulted in several conclusions regarding the issues that need to be resolved. It relates to the development of Audiovisual Aid (AVA) at NCC. The development is related to services at NCC in the form of nutritional assessment, nutrition diagnosis and nutrition counselling. NCC needs capable health promotion media to educate and promote NCC services. In addition, it is also necessary to develop an identity in the form of a Mascot character that is in accordance with the character of the NCC as a nutrition service center. From the FGD, some needs found, such as introducing NCC, increasing visits to NCC, and providing nutrition education on dietary regulation. As a new nutrition service provider, NCC needs to be self-reliant to be known by the public. In utilizing health services, consumers are influenced by several considerations, one of which affects consumer considerations is Brand Equity. Brand equity includes brand awareness, associations, and consumer-perceived quality[8][10][11].

Stage 2: Define

After getting the user's needs, the research team identified the need for promotional media that matched the problem and generated several alternative ideas/solutions. Some of the points from implementing the Focus Group Discussion (FGD) include the development of health promotion media for NCC is related to two things, namely educational media and promotional media. NCC health promotion media development needs to be known and attached to the public. Therefore, it requires strengthening the character in the form of an "NCC Mascot", which can make an impression, attract the interest of NCC users and persuade the public regarding health education. Based on the discussion results, the mascot design depicted leads to a solutive, balanced, healthy, active character and can assess nutritional status. In the branding aspect, the mascot is defined

as a living character who represents the attributes and values of the brand itself. Mascots are fictional figures who can build an identity and create and express the brand's personality. It can also help marketing targets to identify, remember, and understand a brand[12]. In the initial discussion of character development in the form of an overview of several forms, including animated humans, eggs, citrus fruits, melons, and balanced nutrition, hands must represent Jember State Polytechnic (Smart, Innovative, and Professional) and unisex. Meanwhile, the agreement on the character's appearance is in the form of an egg animation with a natural colour background bearing the NCC logo.
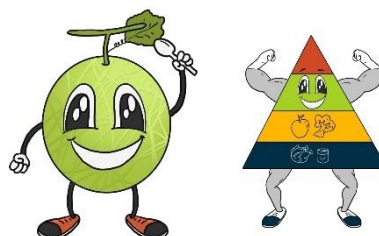

Figure 2. Examples of early Mascot Characters

The solution obtained from other FGD results is jingles. The role of the lyrics in the jingle can describe the message we want to convey[13]. Advertising creativity, jingles and endorsers have a positive and significant influence on brand awareness[14]. However, discussions with users, especially students, making jingles is not required yet, because most students like educational media that are entertaining and have a storyline.

For the development of AVA product (video), videos relating to nutritional assessment are made, namely anthropometric measurements, body composition measurements, and blood sugar, cholesterol, and uric acid tests. Nutrition consultation services include nutritional needs analysis, nutrition diagnosis, and meal plans. These services require health promotion media that can educate and promote available services. The next development plan will be to open nutrition catering services and nutrition cafes that provide healthy food products to students and other academic communities.

Stage 3: Ideate

The team will choose the best solution for the patient's problems and needs. The creative concept is made for designing materials to be presented in AVA. Another important thing is to determine the specification of hardware and software requirements to support team performance.

The creative concept design is a mascot that will appear in every NCC media. In audio-visual media design, the mascot will appear in the video to introduce the NCC profile and provide nutritional messages to the audience. Visual elements such as illustrations, typography, and layouts will make the delivery of information more attractive and follow the audience's characteristics, namely the academic community and the general public in their productive age. Brand mascot has a positive effect on brand awareness and purchase intention[15]. NCC managers can use special capacity mascots to enhance NCC's position in the minds of consumers and ultimately increase NCC visits.

The analysis results show that the most relevant and agreed-upon mascot character is an egg-shaped character with identical characters with NCC. From here, the researchers developed several forms of egg characters as mascot identities. The character of eggs describes foods with high nutritional value. Eggs contain a variety of nutrients that support metabolic health. For instance, eggs are a complete source of high-quality protein and contain 16 vitamins and minerals. Furthermore, eggs this is affordable food. Eggs are a potential food source to be considered for inclusion in the diet of food-insecure children and adults[16].

The content in the video is based on the results of the discussion and includes an overview of NCC (Profile Video) and education on nutrition problems. Problems such as obesity and a balanced nutritional diet (educational video). The video will become a reference that is studied to encourage innovation. Analyzing the profile and types of services at the Jember State Polytechnic NCC will significantly assist the proposed concept. The following specifications for the devices used in media development are presented in Table 2.

Table 2. Media development tool specifications

No	Device Type	Specification
1	Hardware	Processor : Intel® Core™ i9-11900KF Processor 3.5GHz (16M Cache, up to 5.2 GHz, 8 cores)
		Chipset : Intel® Z590 Chipset
		Memory : 32GB (16GB DDR4 U-DIMM x 2)
		Storage : 1TB SATA 7200RPM 3.5" HDD + 1TB M.2 NVMe™ PCIe® 3.0 SSD
		Graphics : NVIDIA® GeForce® RTX3080 10GB DDR6X non LHR : 3x DP, 2x HDMI
		Display : LED ASUS XG258Q 25
2	Software	1. Adobe Photoshop
		2. Corel Draw
		3. Adobe Premiere
		4. Adobe After Effect
		5. Moho
		6. After effect
		7. Davinci resolve

Stage 4: Prototype

The next step is making a prototype from the product idea and solution the team agrees on. This stage involves visualizing ideas and concepts starting from research, thumbnails, roughs, comprehensiveness, and ready to press[17]. At the research stage, the steps taken are to identify the image that you want to build, such as: solutive, balanced nutrition, healthy, active, measuring/assessment of nutritional status. Thumbnail stage is the process of making alternative visualizations of ideas quickly in the form of small sketches (thumbnails). Thumbnails are the stages in finding general visual ideas, sorting, and choosing one of the many design alternatives. thumbnail stage is shown in Figure 3.

A rough layout is an initial sketch that describes the concept and visuals in more detail and actual size[18]. This rough sketch will be the chosen visual alternative and will be processed into a computational form. The development of the mascot is adapted to the user's request, so that the NCC mascot character is like so that the NCC mascot character as in the Figure 3. The researcher conducted a survey on the mascot character in Figure 3 and it was found that the most chosen mascot was mascot D with 38.5% of voters. Several proposed names were also given, including Meggy, Nutriegg, Si Nucca, Si Gina, Gidza and so on. The selection of the mascot name took into account the ease of pronunciation, easy to remember, unisex and describes the character of NCC so that the chosen mascot name was "Si Nucca".

The next step is making a prototype from the product idea and solution the team agrees on. This stage begins with creating a storyboard, creating a mascot character design

along with supporting assets in a 2D form. The creation of a 2D animated Video is also carried out in this stage. Complementing the developed AVA, the team will also include audio elements such as dubbing and music. This prototype is a product that will be presented to users. So that users can get a complete picture of their products.
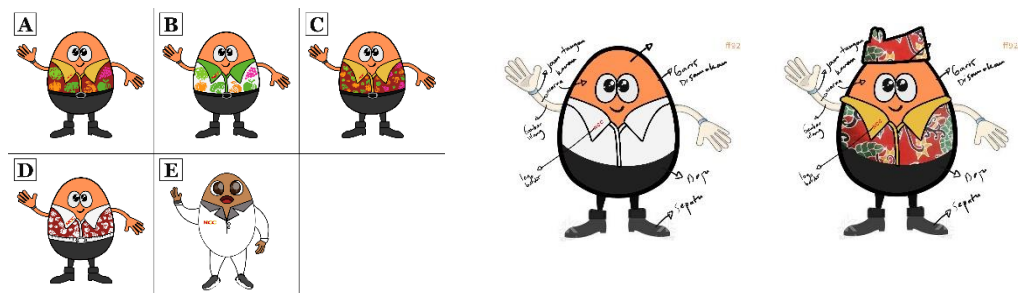

Figure 3. Thumbnail and Rough Sketch

For the technical needs of mascot design details, researchers also present mascots in standard action with appearances from the front, sides, and back (comprehensiveness stage). This is conducted as a guide if the mascot is implemented in video clashes and three-dimensional forms, action figures, or mascot dolls, so that the mascot can be realized in the form of media for communication, socialization or promotion needs.
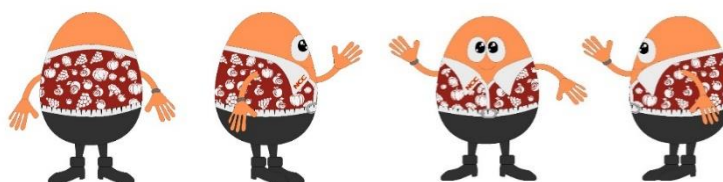

Figure 4. NCC Mascot Character Prototype Development

At the ideate stage, the development of profile videos is carried out by formulating the idea of designing a storyboard resulting from the NCC service and data related to the NCC profile owned. Meanwhile, Educational Videos were developed by creating a short story about a nutritional problem common to NCC users, namely obesity. The development of profile video and educational videos content was reviewed by confirming each content through an interview with the Head of NCC. Profile video and educational video are developed into storyboards. The preparation of storyboards for the videos aims to determine the direction of information so that it is not out of track[19]. After obtaining the final storyboard, the scene recording and animation content creation are carried out. Animation content creation begins with designing role character objects, merging these objects, and voicing and rendering so that complete content is produced. Profile video and educational video developed into storyboards with 3 times revisions from users and counselors, as well as discussions with the video team regarding the quality that will be produced. Profile video development shown in Figure 5.
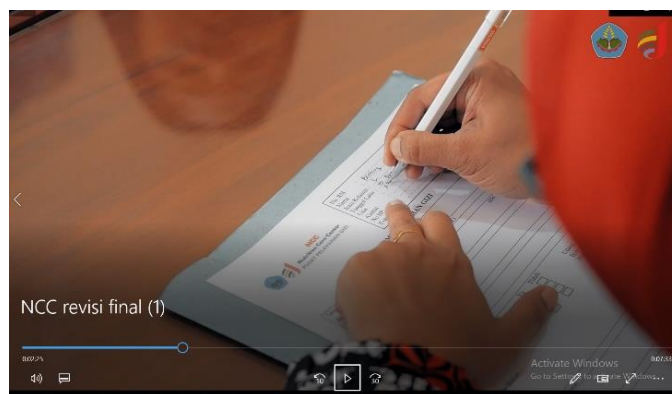
Figure 5. NCC Profile Video

Educational videos tell about how a teenager who has nutritional problems (obesity) can be given nutritional services to get the right dietary recommendations for nutritional problems experienced. The development of educational video is associated with the existence of the NCC, and the mascot figure is added as an identity in the video. Seeing the instructor's face and gaze in the demonstration video examples affected attention allocation but not learning[3]. Storyboard development is presented in Table 3.

Tabel 3. The Storyboard Concept

Storyboard	Part	Activity	Duration
Profile Videos	Opening	Bumper video, Mascot delivers introductions and various nutritional problems, especially obesity	60 second
	Body	Talent scene (M1, M2) dialogue about her weight problem and decides to visit NCC	60 Seconds
		Talent scene (M1) having dialogue with nutritionist and nutritionist assistant	130 seconds
		Talent scene of nutritionist and mascot explaining about NCC	
		Talent scene (M1)having dialogue with nutritionist	150 seconds
		Talent scene (M1, M2) having a dialogue about the results of the consultation	50 seconds 20 seconds
	Closing	The mascot conveys the conclusion and the closing rhyme, NCC Logo Reveal	50 seconds
	Total Time		**520 seconds**
Educational Videos	Opening	Bumper video, illustration about nutrition problem by NCC mascot with speaking style	50 seconds
	Body	Explanation of NCC by the mascot, Head of the NCC Laboratory,	150 seconds
	Closing	Head of Health Department, NCC Logo Reveal	60 seconds
	Total Time		**260 seconds**

After the storyboard is compiled, this research is continue to find artist talent and voice over talent. At the implementation stage, the development of profile and educational videos involves several stakeholders within the scope of the Department of Health, Jember State Polytechnic, as well as selecting students who are suitable with the needs of video development. In the next stage, the setting of the shooting location and the

costumes used by the talents are determined. Filming is carried out effectively for 7-10 days, where shooting is carried out professionally by experts in the field of multimedia. The Editing process took 2 Months, with revisions and improvements to the mascot animation section 8 times.

Stage 5: Test

Finally, the design thinking stage is to test prototypes. The trial is directly faced with the user as a form of validation of whether the information, video flow, and animation align with the user's expectations. The team will record and carry out the repair if there is feedback or a request for improvement. This final stage is critical for the proposed AVA product to truly address the needs of NCC partners.

The Profile Video was not validated but was disseminated directly to the managers of the Department of Health and NCC. Meanwhile, the Educational Video was validated by two material experts and media experts with consideration of expertise and experience working for five years in the field of Health Promotion and multimedia.

The assessment instrument was developed using a Likert scale, with several indicators relating to the quality of multimedia production, the quality of the mascot, the peculiarities of the mascot, the quality of information, the clarity of the content, the harmony and suitability of the content and multimedia forms, which was carried out with once revision, with the results presented in Table 4.

Table 4. Validation Media and Material

Aspects	Indicator	Validation				Ideal Score
		1	%	2	%	
Media	Multimedia Production Quality	4	80	5	100	5
	Mascot Quality	4	80	5	100	5
	Peculiarities of the Mascot	4	80	5	100	5
	Conformity of multimedia content and form	3	60	4	80	5
	Audience reception	3	60	4	80	5
Material	Quality of Information	4	80	5	100	5
	Content Clarity	4	80	5	100	5
	Harmony	3	60	4	80	5
	Educational and persuasion skills	4	80	5	100	5
	Attracting interest in learning	4	80	5	100	5
	Average	**3,7**	**74%**	**4,7**	**94%**	**5**

Based on Table 4, after comparing with the interval scale, the interpretation of the assessment is "Very Good" for media validation. Several factors can influence the process of providing health education to achieve behavior change. Table 5 showing the results of the media acceptance test, it can be seen that there are three aspects that are assessed on the media that have been developed, including aspects of effectiveness, aspects of attractiveness, and aspects of efficiency which overall get a score of 4.47 with "Good" interpretation. internally and externally through social media, and LED monitors available in each unit at the Jember State Polytechnic.

Table 5. Media Acceptance Test Results

No.	Rated aspect	Indicator	Average
1.	Effectiveness	Clarity of educational goals	4,3
		Achievement of educational goals	4,2
2.	Attractiveness	Media display clarity	4,7
		Clarity of material delivery	4,7
		Clarity of use of terms	4,5

No.	Rated aspect	Indicator	Average
		Clarity of the language used	4,7
		Clarity of voice in media	4,5
		Clarity of text or writing in the media	4,5
		Accuracy of color composition selection	4,6
3.	Efficiency	Media can be used without crowding	4,5
		Duration on media	4,0
		Total Score	**49,2**
		Average	4,47
		Data Interpretation	Good

The process of providing health education that aims to achieve behavior change can be influenced by several factors, including the material factors that are delivered to the target, the teaching aids used in the media, the methods used in providing health education, and health promotion officers[19]. Each educational and NCC profile video has a final duration of 9 minutes 58 seconds and 3 minutes 40 seconds. Educational videos that have a duration of more than 3 minutes will cause the audience to lose interest in watching because too much information is conveyed[20]. The long duration can be a weakness of this educational video so it needs to be modified, for example making the video into several parts. They can be a means of education and health promotion both.

4. Conclusions

The AVA media was developed through the stages of emphatize, define, ideate, prototype and test to obtain NCC profile video, educational video and the NCC mascot with an egg character named Si Nucca, an acronym for the Nutrition Care Center. The character of eggs describes foods with high nutritional value and are affordable by the community. The results of media validation by the material and media validators got good results with an average score of 4.7. Acceptance test results show a score of 4.47 with a good interpretation on the aspects of effectiveness, attractiveness and efficiency. The audio-visual media that has been developed is feasible to be tested on the public.

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