A QUESTIONNAIRE TO MEASURE DIGITAL HEALTH LITERACY COMPETENCIES FOR CITIZENS (PSYCHOMETRIC EVALUATION)
DIGITAL HEALTH LITERACY COMPETENCIES FOR CITIZEN
(DHLC)

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LEMBAGA PENELITIAN DAN PENGABDIAN KEPADA MASYARAKAT

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MEASUREMENT INSTRUMENTS
DIGITAL HEALTH LITERACY COMPETENCE FOR CITIZEN
(DIGITAL HEALTH LITERACY COMPETENCIES FOR CITIZEN-DHLC)

1. BACKGROUND

The development of digital technology is inseparable from the Industrial revolution 4.0 which leads to everything digital and network-based in all sectors of people's lives and encourages social innovation [1]. Social innovations, including the health sector, are also affected by the Industrial Revolution 4.0, both directly and indirectly, both in medical and non-medical services. This condition requires the community to have more capabilities in the form of digital health literacy. Digital health literacy is the skills, knowledge and practice related to health that a person needs in order to function optimally in the e-Health and digital-based information community [2].
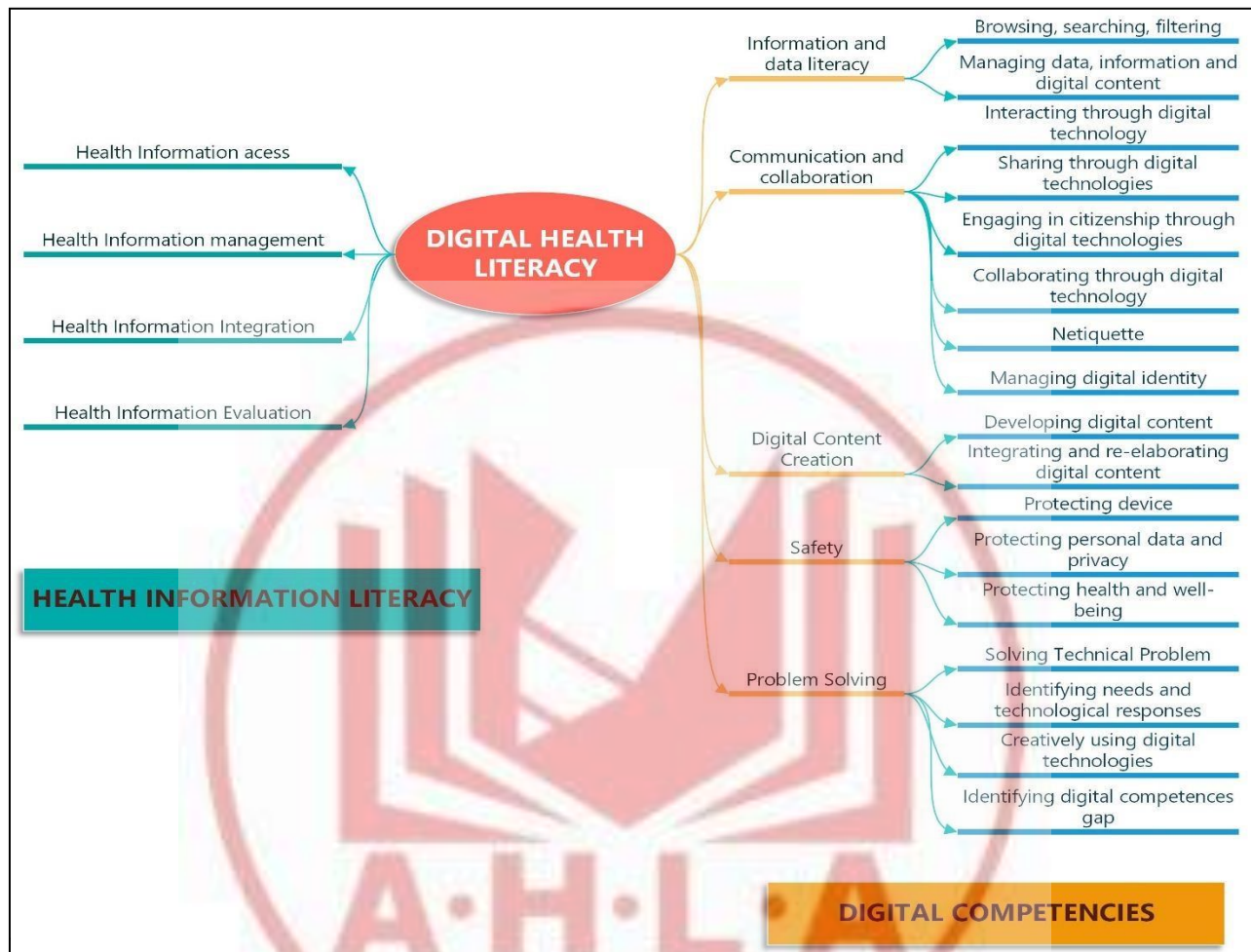
The low level of digital health literacy makes people unable to sort out the information received massively through social media or online media so that it can result in making wrong decisions about matters directly related to health or not, in the case of the Covid 19 pandemic, for example refusing to use masks, refusing Funeral for Covid-19 positive patients etc. Furthermore, the community will be hampered from utilizing digital-based health services (e-Health) which will be detrimental to the community itself because e-Health has been proven to be safer, more efficient and effective [3]. Therefore, it is necessary to develop a measurement tool or instrument for measuring digital health literacy competence in the community.

This measurement instrument is called Digital Health Literacy Competencies for Citizen (DHLC), which is a questionnaire that contains indicators for measuring digital competence and Health literacy.

2. FRAMEWORK

DHLC was developed from a literature review and has been tested for validity and reliability [4], the main reference for digital competence is "The digital competences framework

for citizens-DigComp 2.1"[5] and "ehealth literacy scale"[6]. With indicators as follows:

DHLC terdiri dari mini kompetensi aaa ... tingkat dan dijabarkan dalam 18 pertanyaan dan 4 competencies in Health information literacy and described in 8 questions. In total there are 26 questions.

Table 1. Indikators in DHLC Questionnaire

NO	INDICATORS THE DHLC	INDIKATOR DHLC
A	DIGITAL COMPETENCIES	Kompetensi Digital
1	*Information and data literacy*	*Literasi data dan Informasi*
1.1	Browsing, searching and filtering data, information and digital content	Selancar, mencari dan menyaring data, infomasi dan digital konten
2	*Communication and collaboration*	*Komunikasi dan Kolaborasi*
2.1	Interacting through digital technologies	Melakukan interaksi menggunakan tehnologi digital

NO	INDICATORS THE DHLC	INDIKATOR DHLC
2.2	Sharing through digital technologies	Melakukan sharing menggunakan tehnologi digital
2.3	Engaging in citizenship through digital technologies	Berhubungan dengan anggota masyarakat lain melalui tehnologi digital
2.5	Netiquette	Etika dalam jaringan
2.6	Managing digital identity	Mengelola identitas
3	*Digital content creation*	*Membuat kreasi konten digital*
3.2	Integrating and re-elaborating digital content	Melakukan integrasi dan elaborasi ulang
4	*Safety*	*Keamanan*
4.1	Protecting devices	Melindungi perangkat
4.2	Protecting personal data and privacy	Melindungi data individu dan privasi
4.3	Protecting health and well-being	Melindungi Kesehatan dan kesejahteraan
5	*Problem solving*	*Pemecahan masalah*
5.1	Solving technical problems	Menyelesaikan masalah tehnis
5.2	Identifying needs and technological responses	Meng-identifikasi kebutuhan dan tehnologi respon
5.3	Creatively using digital technologies	Kreatif menggunakan tehnologi digital
5.4	Identifying digital competence gaps	Meng-identifikasi kesenjangan kompetensi digital
B	HEALTH INFORMATION LITERACY	**Literasi Informasi Kesehatan**
6	*Health Information Access*	*Meng-akses informasi kesehatan*
7	*Health Information Management*	*Mengatur informasi managemen*
8	*Health Information Integration*	*Mengintegrasi informasi kesehatan*
9	*Health Information Evaluation*	*Meng-evaluasi informasi kesehatan*

Competence in the questionnaire questions is divided into 8 abilities, namely::
1. Can not
2. It's so Hard Need Help
3. It's Hard Need Help
4. Easy Need Help
5. Easy Without Help
6. Easy, Can Help Others
7. It's Easy if there are No Problem
8. Very Easy, Can Solve the Problem

3. MEASUREMENT AND INTERPRETATION

Table 2. Indicators and Question Items DHLC

No	Indicators	Can Not	It's so Hard Need Help	It's Hard Need Help	Easy Need Help	Easy Without Help	Easy, Can Help Others	It's Easy if There are No Problem	Very Easy, Can Solve the Problem
		0	1	2	3	4	5	6	7
A	**DIGITAL COMPETENCIES**								
1.	**Information and data literacy**								
1.1	**Browsing, searching and filtering data, information and digital content**								
1	I can identify list of generic keywords and tags available those which would be useful for finding information related topic								
2.	**Communication and collaboration**								
2.1	**Interacting through digital technologies**								
2	I can use a commonly-used chat on my smartphone (e.g. Facebook messenger or WhatsApp, Line, Telegram) to talk to my friends in daily use								
3	I can manage a group commonly-used chat on my smartphone (e.g. Facebook messenger or WhatsApp, Line, Telegram) such as create group, add or delete members								
2.2	**Sharing through digital technologies**								
4	I can use a commonly- used chat on my smartphone and a cloud-based storage system (e.g. Dropbox, Google Drive) to share material (message, file, picture, link) with other members of my group								

2.3	**Engaging in citizenship through digital technologies**									
5	I can propose and use different media strategies (e.g. Survey on FaceBook, Hastags on Instagram and Twitter) to empower the citizens of my city to participate in defining the main topics of an event									
2.5	**Netiquette**									
6	I can manage and solve problems that arise while writing and communicating in digital environments, (e.g. inappropriate comments or Hoax in my social network)									
2.6	**Managing digital identity**									
7	I can manage a new social media that avoids actions which could harm my digital data reputation (e.g. spam) when using social media in internet									
3.	**Digital content creation**									
3.2	**Integrating and re-elaborating digital content**									
8	I can make video from a tutorial video on YouTube or Instagram, how to create a brief video on my tablet/mobile phone to present content video such as video related health									
4.	**Safety**									
4.1	**Protecting devices**									
9	I can protect my social media (e.g. Twitter, Facebook, Instagram) account such as using different methods (e.g. a strong password, control the recent logins)									
10	I can detect risks like receiving tweets and messages from others with false profiles or phishing attempts									

4.2	**Protecting personal data and privacy**									
	Protecting personal data and privacy									
11	I can select the most appropriate way to protect my personal data and others (e.g. address, phone number) when sharing digital content (e.g. a picture) on the social media									
12	I can distinguish between appropriate and inappropriate digital content to share it on my social media, so that my privacy and that of my friends are not damaged									
4.3	**Protecting health and well-being**									
13	I can create a digital health campaign using social media (e.g. Twitter, FB) which can be shared and used by others on their smartphones or tablets									
5.	**Problem solving**									
5.1	**Solving technical problems**									
14	I can identify a simple technical problem from a list of those that can arise while using a digital device, and I can identify what type of IT support would solve it									
5.2	**Identifying needs and technological responses**									
15	I can make adjustment on my computer/smartphone/ tablet such as can make the font larger to help the readability while reading on the screen of my tablet / computer / smartphone									
5.3	**Creatively using digital technologies**									
16	I can select digital tools and technologies that can be used to create well-defined knowledge and well-defined innovative processes and products related health									

17	I can collaborate with my friend in some cognitive processing to understand and resolve well-defined and routine conceptual problems and problem situations in digital environments								
5.4	**Identifying digital competence gaps**								
18	I can evaluate whether new digital environments that I find while surfing are appropriate								
B	**HEALTH INFORMATION LITERACY**								
1.	**Health Information Access**								
19	Know what kind of health information can be found on the internet								
20	I know where can find useful health information on the internet								
2.	**Health Information Management**								
21	I know that the internet can be used as a health information resources								
22	I know how to find useful health information on the internet								
3.	**Health Information Integration**								
23	I know how to use the internet to answer questions about health								
24	I know how to use health information that had been found to help my daily task								
4.	**Health Information Evaluation**								
25	I can evaluate health information found on the internet								
26	I can differentiate between correct and incorrect health information found via the internet								

Scoring of Health Literacy Index

The score results from the 26 DHLC questions will be used to measure the level of digital health literacy competence in the form of the Digital Health Literacy Competencies Index. The general calculation for the Digital Health Literacy Competencies index is as follows:

$$\textbf{Index} = (\boldsymbol{mean - 1}) * \left(\frac{\textbf{50}}{\textbf{3}} \right)$$

The Calculation Method is:

DHLC Index   = $(((Q1 + Q2 + Q3 + Q4 + Q5.... + Q26)/26)-1)*50/3$.

The Category of Health Literacy Index are:

0-50	= 'Beginner'
>50 to 70	= 'Independent'
>70 to 90	= 'Advance'
>90-100	= 'Expert'

4. CLOSING

Digital health literacy is really needed by the community to respond to digital transformation which also involves the health sector. Society needs to be ready to face change. With this measurement instrument, it is possible to know and improve the competencies that need to be improved so that the digital transformation of the Health sector can function optimally to support the Health program.

5. REFERENCE

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6. Norman, C.D. and H.A. Skinner, *eHEALS: The eHealth Literacy Scale.* J Med Internet Res, 2006. **8**(4): p. e27.

6. ATTACHMENT

QUESTIONNAURE OF DIGITAL HEALTH LITERACY COMPETENCIES (DHLC)

DESCRIPTION:

0 = Can not	**4 = Easy Without Help**
1 = It's so Hard Need Help	**5 = Easy, Can Help Others**
2 = It's Hard Need Help	**6 = It's Easy if there are No Problem**
3 = Easy Need Help	**7 = Very Easy, Can Solve the Problem**

No	Indicators	Can Not	It's so Hard Need Help	It's Hard Need Help	Easy Need Help	Easy Without Help	Easy, Can Help Others	It's Easy if There are No Problem	Very Easy, Can Solve the Problem
		0	1	2	3	4	5	6	7
A	**DIGITAL COMPETENCIES**								
1	I can identify list of generic keywords and tags available those which would be useful for finding information related topic								
2	I can use a commonly-used chat on my smartphone (e.g. Facebook messenger or WhatsApp, Line, Telegram) to talk to my friends in daily use								
3	I can manage a group commonly-used chat on my smartphone (e.g. Facebook messenger or WhatsApp, Line, Telegram) such as create group, add or delete members								

No	Indicators	Can Not	It's so Hard Need Help	It's Hard Need Help	Easy Need Help	Easy Without Help	Easy, Can Help Others	It's Easy if There are No Problem	Very Easy, Can Solve the Problem
		0	1	2	3	4	5	6	7
4	I can use a commonly- used chat on my smartphone and a cloud-based storage system (e.g. Dropbox, Google Drive) to share material (message, file, picture, link) with other members of my group								
5	I can propose and use different media strategies (e.g. Survey on FaceBook, Hastags on Instagram and Twitter) to empower the citizens of my city to participate in defining the main topics of an event								
6	I can manage and solve problems that arise while writing and communicating in digital environments, (e.g. inappropriate comments or Hoax in my social network)								
7	I can manage a new social media that avoids actions which could harm my digital data reputation (e.g. spam) when using social media in internet								
8	I can make video from a tutorial video on YouTube or Instagram, how to create a brief video on my tablet/mobile phone to present content video such as video related health								

No	Indicators	Tidak bisa	Sangat sulit Butuh bantuan	Sulit Butuh bantuan	Mudah Butuh bantuan	Mudah Tanpa bantuan	Mudah Dapat Membantu orang lain	Sangat mudah Jika tanpa masalah	Sangat mudah dapat mengatasi masalah
9	I can protect my social media (e.g. Twitter, Facebook, Instagram) account such as using different methods (e.g. a strong password, control the recent logins)								
		0	1	2	3	4	5	6	7
10	I can detect risks like receiving tweets and messages from others with false profiles or phishing attempts								
11	I can select the most appropriate way to protect my personal data and others (e.g. address, phone number) when sharing digital content (e.g. a picture) on the social media								
12	I can distinguish between appropriate and inappropriate digital content to share it on my social media, so that my privacy and that of my friends are not damaged								
13	I can create a digital health campaign using social media (e.g. Twitter, FB) which can be shared and used by others on their smartphones or tablets								
14	I can identify a simple technical problem from a list of those that can arise while using a digital device, and I can identify what type of IT support would solve it								

No	Indicators	Can Not	It's so Hard Need Help	It's Hard Need Help	Easy Need Help	Easy Without Help	Easy, Can Help Others	It's Easy if There are No Problem	Very Easy, Can Solve the Problem
		0	1	2	3	4	5	6	7
15	I can make adjustment on my computer/smartphone/ tablet such as can make the font larger to help the readability while reading on the screen of my tablet / computer / smartphone								
16	I can select digital tools and technologies that can be used to create well-defined knowledge and well-defined innovative processes and products related health								
17	I can collaborate with my friend in some cognitive processing to understand and resolve well-defined and routine conceptual problems and problem situations in digital environments								
18	I can evaluate whether new digital environments that I find while surfing are appropriate								
B	**HEALTH INFORMATION LITERACY**								
19	I know what kind of health information can be found on the internet								
20	I know where can find useful health information on the internet								
21	I know that the internet can be used as a health information resources								
22	I know how to find useful health information on the internet								
23	I know how to use the internet to answer questions about health								

No	Indicators	Can Not	It's so Hard Need Help	It's Hard Need Help	Easy Need Help	Easy Without Help	Easy, Can Help Others	It's Easy if There are No Problem	Very Easy, Can Solve the Problem
		0	1	2	3	4	5	6	7
24	I know how to use health information that had been found to help my daily task								
25	I can evaluate health information found on the internet								
26	I can differentiate between correct and incorrect health information found via the internet								

REPUBLIK INDONESIA
KEMENTERIAN HUKUM DAN HAK ASASI MANUSIA

SURAT PENCATATAN

CIPTAAN

Dalam rangka pelindungan ciptaan di bidang ilmu pengetahuan, seni dan sastra berdasarkan Undang-Undang Nomor 28 Tahun 2014 tentang Hak Cipta, dengan ini menerangkan:

Nomor dan tanggal permohonan	:	EC00202247469, 25 Juli 2022
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Kewarganegaraan	:	Indonesia
Jenis Ciptaan	:	**Karya Tulis Lainnya**
Judul Ciptaan	:	**Kuesioner Pengukuran Kompetensi Literasi Kesehatan Digital Secara Psikometrik : Digital Health Literacy Competencies For Citizen (DHLC)**
Tanggal dan tempat diumumkan untuk pertama kali di wilayah Indonesia atau di luar wilayah Indonesia	:	19 Maret 2022, di Semarang
Jangka waktu pelindungan	:	Berlaku selama hidup Pencipta dan terus berlangsung selama 70 (tujuh puluh) tahun setelah Pencipta meninggal dunia, terhitung mulai tanggal 1 Januari tahun berikutnya.
Nomor pencatatan	:	000363218

adalah benar berdasarkan keterangan yang diberikan oleh Pemohon.
Surat Pencatatan Hak Cipta atau produk Hak terkait ini sesuai dengan Pasal 72 Undang-Undang Nomor 28 Tahun 2014 tentang Hak Cipta.

a.n Menteri Hukum dan Hak Asasi Manusia
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