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Development of Interactive Learning Media Based on Google Application for Distance Learning in Universitas Pendidikan Indonesia

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***Abstract*—This research aims to develop interactive learning media distance learning. In order to support the industrial revolution 4.0, human resources are expected to be skilled in making and using technology. One of them is development of learning model 4.0 where learning can be done anywhere and without being constrained by the distance with the support of information and communication technology (ICT). This paper provides information about development of media based google site. This research is one of the research roadmaps that will be held for three years ahead. Early research is to make learning media based on google site prepared as the media in 4.0 learning. In the digital media we created contain learning purpose, learning mater based on text, picture, and video, practices, tasks, and references. The results of this research also discussed about production systematics, usage, and benefit of application in learning process.**

Keywords: interactive learning media, google application, distance learning, 4.0 learning

I. INTRODUCTION

Indonesia has entered the change of industrial revolution 4.0 which affect the community both socially and culturally. Corporate management now leads to dependence will information technology which some kind of work previously done by humans filled with. In addition, corporations in the field of the era of the industrial revolution 4.0 also affect in human resources skill in work. It was not just the kind of skill in accordance with the expertise that is been studied over the study in formal education but also skill in the use of technology and information.

One of activities that are affected by industrial revolution 4.0 is learning process. In which industrial revolution 4.0, learning skills play an important role in give a supplement to those skills students about technology and information. Kementerian Riset, Teknologi, dan Pendidikan Tinggi (Ristek Dikti) said that Indonesia needs to improve the quality of skill labor with digital technology and more than 55 % organization said that digital talent gap wider [1] which means that as technology development applied in corporate but not balanced with more advanced skills of human resources in the management of technology.

That's why the government has said that there should have been the development of a model of learning which according to the development the era of the industrial revolution 4.0. That is learning 4.0 where asserts students learning model to develop literacy study with ICT. Literacy in education is limited to reading process, writing and math as capital base involved in the society. In learning 4.0, students are able to understand a kind of new literacy that can make them more competitive namely data literacy, technology literacy, and human literacy.

Data literacy is the ability to read, examination, and uses information. In which the current technology the learning process not only learn from a source of study abroad but deeper searchable online or digital media based on mobile phone. Literacy technology is an understanding of how to work machine technology applications (can be coding, an artificial intelligence, and engineering principles). While human literacy connected with humanities, communication, and design. Human literacy gathered in social life such as in the academic or society. If these three types of literacy can be packaged in one media learning so it is expected that graduates are more competitive in the community.

II. ROADMAPS RESEARCH AND DIGITAL MEDIA

A. Roadmaps Research

Roadmap in research to explain the learning model 4.0 started in the development of interactive media

learning based on google site that will be implemented in distance learning model. Research object in research is students of Pendidikan Multimedia in Universitas Pendidikan Indonesia. In the learning 4.0 researcher also mixed digital learning with project-based learning (PBL). It is aimed to make students got the better of these three types of new literacy. This research will discuss measures making, digital media began to prepare the learning syllabi (RPS), learning module, creating media on google site, result of application and usage of application.

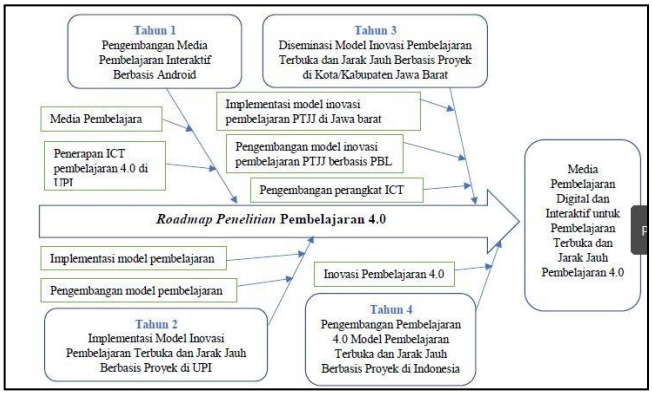


Fig. 1. Roadmaps of Research

B. Digital Media

The rapid the use of digital technology in the world of education will be reflected to changes in the kind of classroom growing distance learning in which lecturers and students do not have to be in the same place , and the increasing number of choice a source of learning which available such as electronic book (e-book), ease to access digital library, e-forum, e-journal, etc. Technology has allowed is the creation global learning environment who placed students in the midst of a learning process, surrounded by a variety of sources learning and electronic services [2].

The use of digital technology in education runs in four different pillars: involving students empower, educator optimize, operation and transform learning all the institutions supported by fundamental educational institutions to give the trusted that can run by the organization. Education institutions today has started to seize, of digital technology improve the efficiency and performance, improve the students, lessons and develop research and innovation. By using digital technology, cost efficiency save time while extending access, encourage learning more effective through the involvement of students and teachers better.

The system and a method of learning when demands a change with the advent of the information technology and communication. It surely needs standard, sustaining innovation, technology, financial resources and men that professional. The use of technology in education make learning more effective , to expand access to information and a source of knowledge to suit the needs of faculty and students [3]. Media learning is intermediate who carries a message or information to instructional or containing the truth of teaching between source and recipients [4]. Media learning is an instrument is functioning and employed to deliver messages learning. One such as a picture most media uses as a theory in learning process is Dale's Cone of Experience [5].

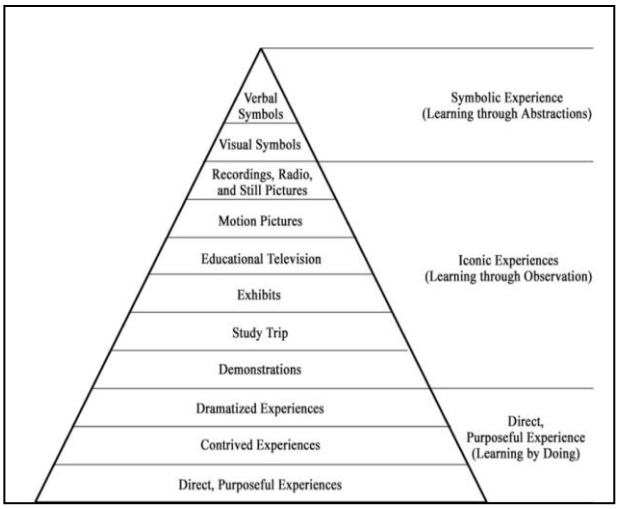


Fig. 2. Dale's Cone of Experience

Edgar dale do experience according to the level of, classification from the most concrete to the most abstract, which is (1) direct, purposeful experiences, (2) contrived experiences, (3) dramatized experiences, (4) demonstrations, (5) study trip, (6) exhibits, (7) educational television, (8) motion pictures, (9), recording, radio, and still pictures, (10) visual symbols, and (11) verbal symbols. So we can conclude that the media are all learning facilities , all forms of communication tool that can be used to given the lectures learning between teachers and students in addition media can also remarkable , feeling , attention , and the ability of students and promoting the achievement of active learning , innovative , creative , effective and fun . In general, mobile learning or called the m-learning or learning or learning based on android mobile is moving mobile use technology that students can learn anywhere in the absence of the time and place [6].

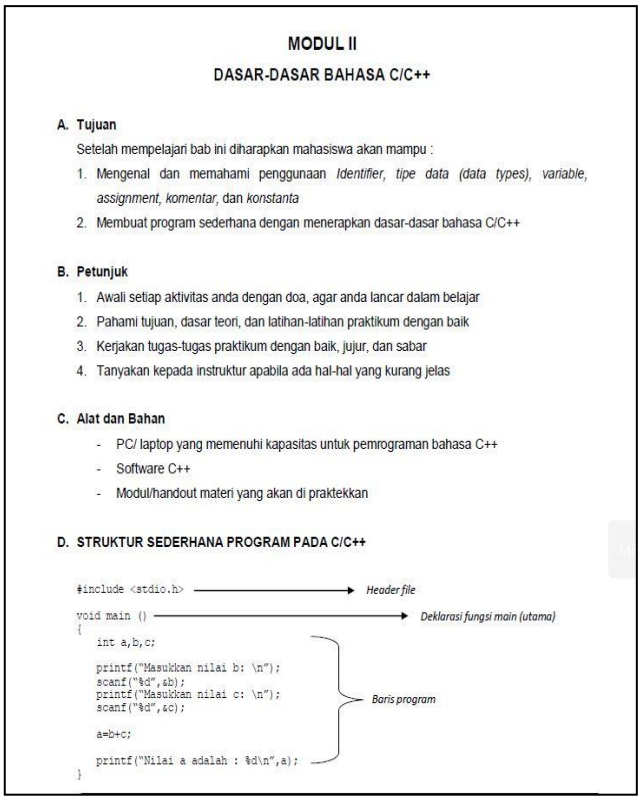
III. Data Preparation in Application Development

Before developing the application, it is necessary to prepare materials needed to make learning materials such as lesson plans (RPS), learning modules, and learning media (Google Site).

A. Lesson plans and modules.

Learning will be inserted into the media is basic programming consisting of introduction of an operating system, IDE Visual C++ and algorithms, basic programming languages of C/C++, condition operators, looping, array, function, pointer, and struct. In module consists of Learning Objectives that describes what is purpose of lessons, Lesson Guide are hints to do the lessons, then tools and materials are

what students need before they study in practicing basic programming language such as personal computer or laptop, software that support C++



MODUL II

DASAR-DASAR BAHASA C/C++

A. Tujuan

Setelah mempelajari bab ini diharapkan mahasiswa akan mampu :

1. Mengenal dan memahami penggunaan *Identifier, tipe data (data types), variable, assignment, komentar,* dan *konstanta*
2. Membuat program sederhana dengan menerapkan dasar-dasar bahasa C/C++

B. Petunjuk

1. Awali setiap aktivitas anda dengan doa, agar anda lancar dalam belajar
2. Pahami tujuan, dasar teori, dan latihan-latihan praktikum dengan baik
3. Kerjakan tugas-tugas praktikum dengan baik, jujur, dan sabar
4. Tanyakan kepada instruktur apabila ada hal-hal yang kurang jelas

C. Alat dan Bahan

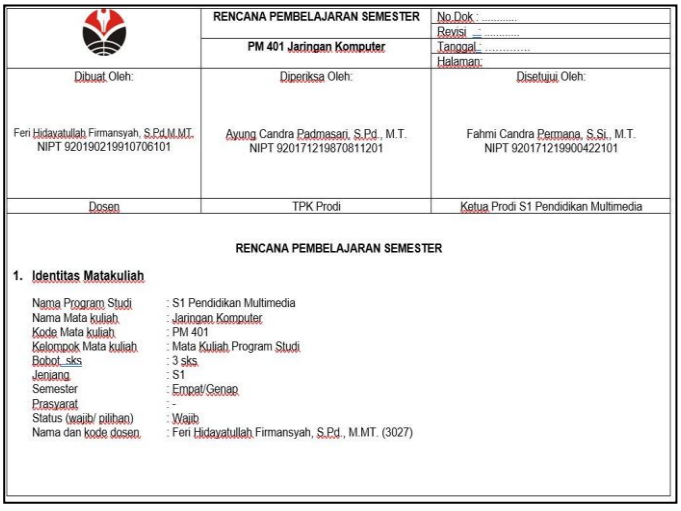
- PC/ laptop yang memenuhi kapasitas untuk pemrograman bahasa C++
- Software C++
- Modul/handout materi yang akan di praktekkan

D. STRUKTUR SEDERHANA PROGRAM PADA C/C++

```
#include <stdio.h>                          Header file
void main ()                                Deklarasi fungsi main (utama)
{
   int a,b,c;

   printf("Masukkan nilai b: \n");
   scanf("%d",&b);
   printf("Masukkan nilai c: \n");          Baris program
   scanf("%d",&c);

   a=b+c;

   printf("Nilai a adalah : %d\n",a);
}
```

language, and this module. Lessons material that introduce the lessons before student do practice. In the last of module, they will do trial practice to knowing how much knowledge they got. After trial practice they will do last assignment and then student shall report what they learn.

Fig. 3. Example module of basic languages



	RENCANA PEMBELAJARAN SEMESTER PM 401 Jaringan Komputer	No.Dok : Revisi : Tanggal : Halaman:
Dibuat Oleh:	Diperiksa Oleh:	Disetujui Oleh:
Feri Hidayatullah Firmansyah, S.Pd.M.MT. NIPT 920190219910706101	Ayung Candra Padmasari, S.Pd., M.T. NIPT 920171219870811201	Fahmi Candra Permana, S.Si., M.T. NIPT 920171219900422101
Dosen	TPK Prodi	Ketua Prodi S1 Pendidikan Multimedia

RENCANA PEMBELAJARAN SEMESTER

1. Identitas Matakuliah

Nama Program Studi	: S1 Pendidikan Multimedia
Nama Mata kuliah	: Jaringan Komputer
Kode Mata kuliah	: PM 401
Kelompok Mata kuliah	: Mata Kuliah Program Studi
Bobot sks	: 3 sks
Jenjang	: S1
Semester	: Empat/Genap
Prasyarat	: -
Status (wajib/ pilihan)	: Wajib
Nama dan kode dosen	: Feri Hidayatullah Firmansyah, S.Pd., M.MT. (3027)

Fig. 4. Example lesson planes that used in developing application

B. Google Site

Google Sites started out as JotSpot, the name and sole product of a software company that offered enterprise social software. It was targeted mainly at small-sized and medium-sized businesses. The company was founded by Joe Kraus and Graham Spencer, co-founders of Excite. Google Sites allows to create a website without having to know how to code it yourself. It falls under the Collaborative category in G Suite, meaning that you can get other Google users in on the website creation process too, which is what makes it so powerful and such a valuable tool for teams.

Digital media and google sites are a couple which is proper for combined and make distance learning media. Google sites provide all distance learning features such as the picture and video that can be played in a live-in application without opening other tab or other application.

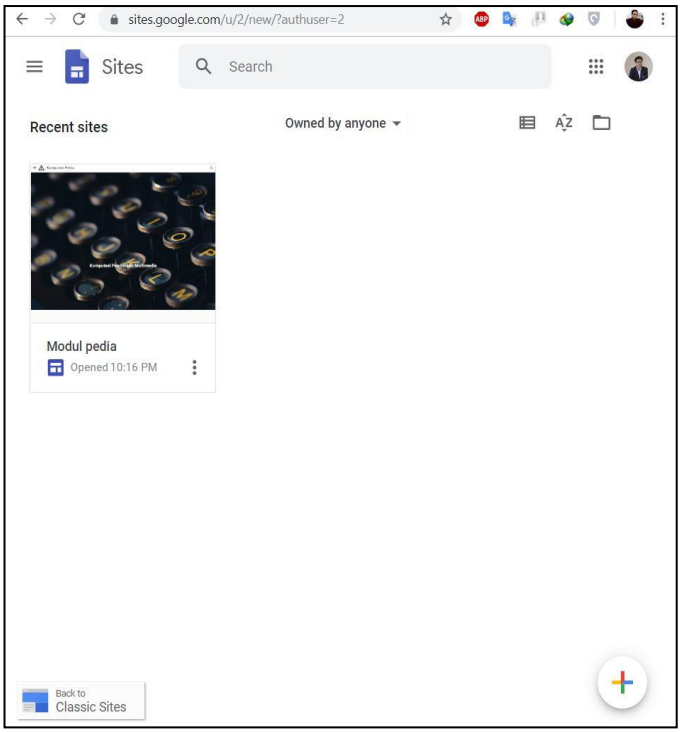


Fig. 5. Google Sites field to create learning module

IV. Application Development Result

After all the materials and matter prepared next stage is to develop applications. Google sites provide project field that users can write or create their own sites freely and Provide tools to include various media. In this paper researchers flash samples of the development of application. The application called Modul Pedia because researchers' affiliation is Pendidikan Multimedia.

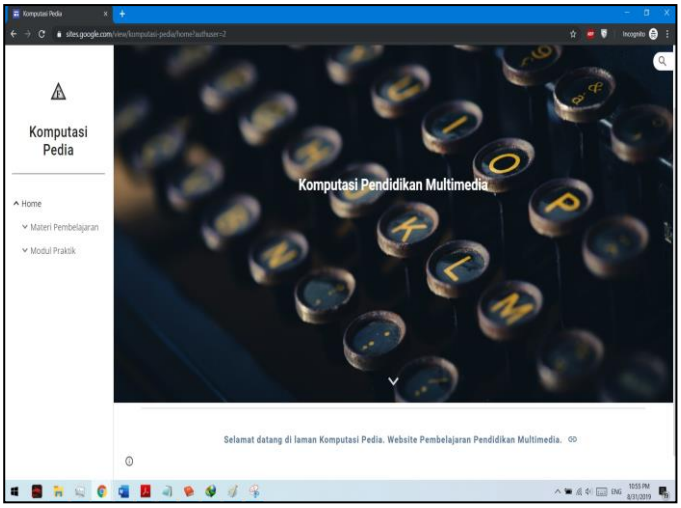


Fig. 6. Homepage of Modul Pedia

On the homepage there are a few lessons that students can learn such as theory or practice.

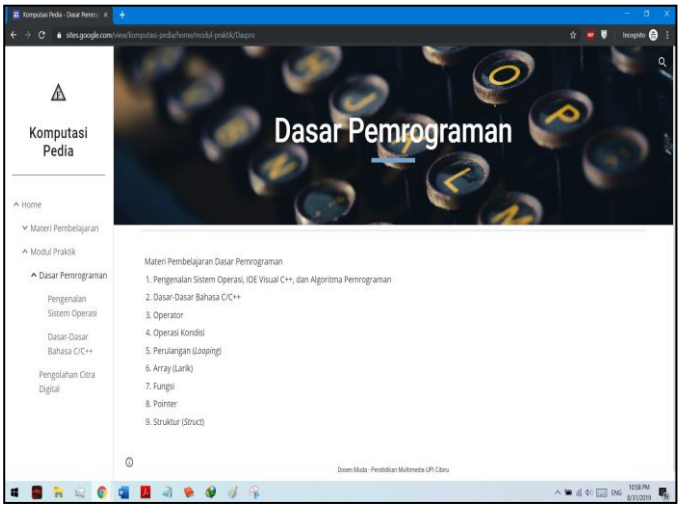


Fig. 7. Basic Programming sites

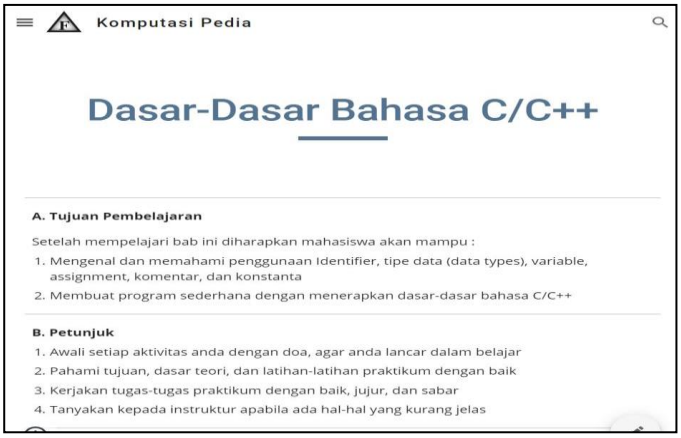
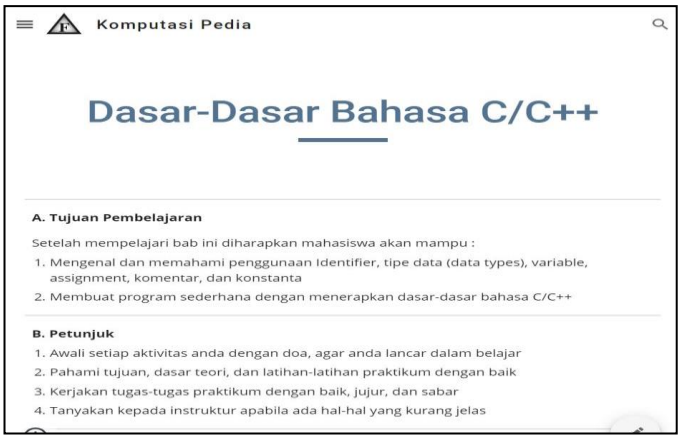


Fig. 8. Basics of Language Programming in C/C++

Object lessons of lesson plan is basic programming, there are 9 chapters that student can learn. Sample of each lesson is chapter 2 Basics of Language Programming in C/C++ (fig 8). In fig. 8 showed purpose learning and guide learning of module.

Fig. 9. Tools and materials needed in lessons chapter



There is a preparation needed by student before they start learning such as personal computer, software that used in practice and this module. And here few figures that include in digital media.

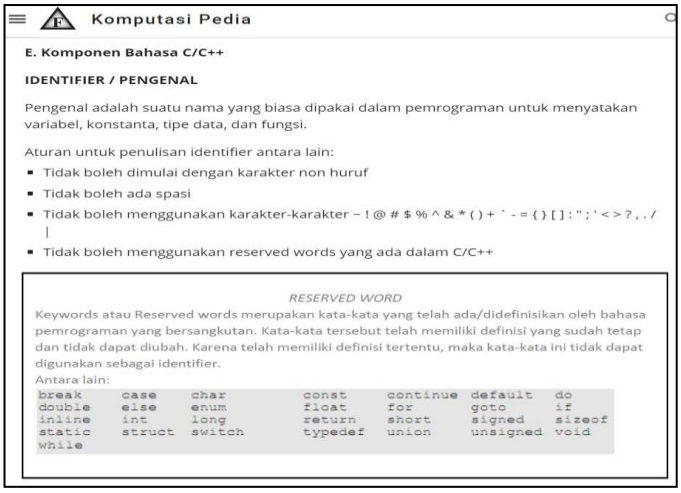


Fig. 10. Introduction lessons

Fig. 11. Tutorial Video

Google site provides media player that allow user or student to play video or other media such as music or sound without opening other tab or other applications. In this site user can read and even play media that support by google site directly.

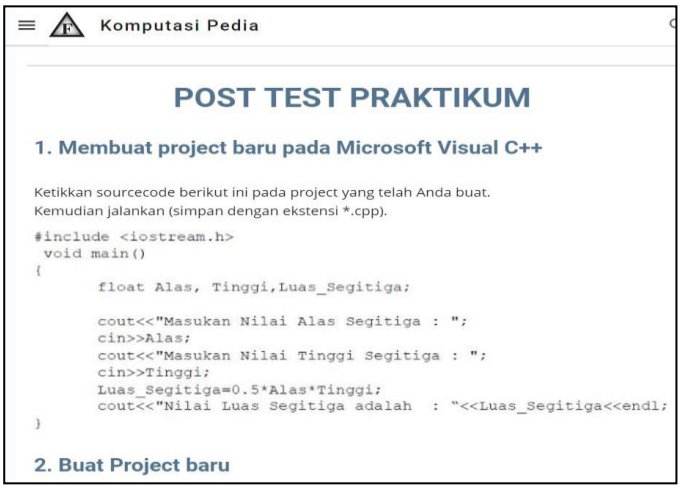


Fig. 12. Post-test practice

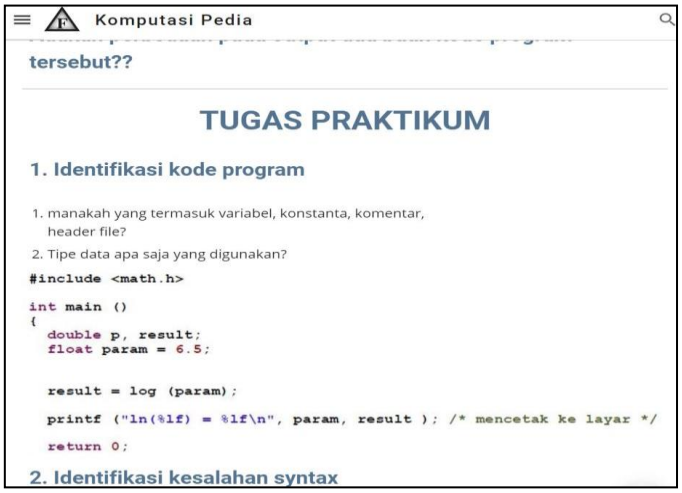


Fig. 13. Practice task/assignment

Usually we conduct practices with posttest aims to understand how much their know about the lessons. And practice assignment as a task undertaken outside the practice and to assess the work of students. Google site also compatible with smart phone or gadget. With this capability google site is the most suitable for use in lesson 4.0 that based on distance learning. Students can learned everywhere and anywhere with their own gadget or others. Compatibility of this media showed in fig 14.

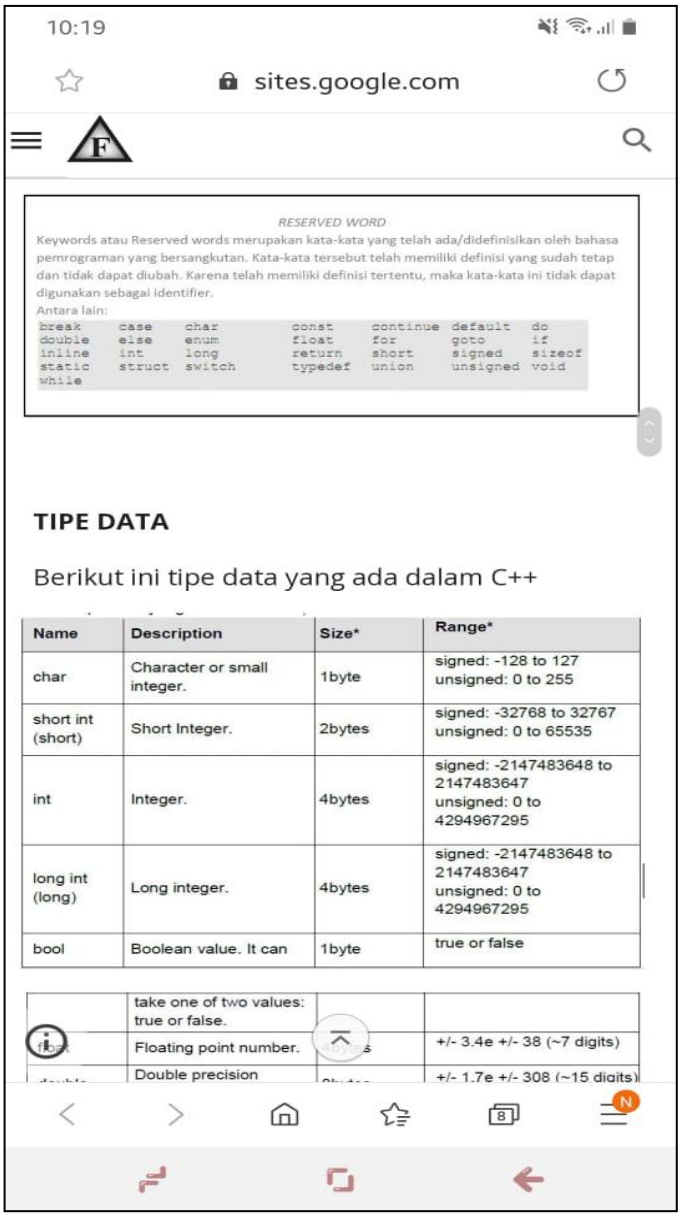


Fig. 14. Digital media that compatible with smart phone

V. CONCLUSIONS

Media learning in the industrial revolution 4.0 varied. Google provides site features the best to make application that supports learning 4.0. With features that can involve various media on one website and compatibility on devices, google site is perfect for the distance learning process and in accordance with learning 4.0 model which is now being developed in Indonesia. This research is still to be continued to the next stages of the implementation of the media and 4.0 learning model to be applied across Indonesia

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