

UNVEILING THE POWER OF OPENAI'S CHATGPT: A EXPLORATION OF AI TECHNOLOGY FOR LEARNING PROGRAMMING

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Abstract

ChatGPT is one of the AI technologies that is currently being discussed on social media. This research aims to examine the development of ChatGPT in the context of learning programming in creating a Village website using PHP. The method used in this research is descriptive qualitative. The focus of this research is the use of ChatGPT in teaching website creation, explaining the stages of creating program code on demand, and correcting incorrect code. It started by asking "can ChatGPT teach website development?", "can ChatGPT explain the stages of program code generation?", and "can ChatGPT fix incorrect code?". Through a series of experiments, ChatGPT was quickly able to explain the stages of learning programming, explain the code to be created, and provide explanations for incorrect program code. The findings of this study show that ChatGPT can follow the complexity of programming according to the question asked, where the more complex the question, the more complex the answer from ChatGPT. However, further research is needed to find out more effective program codes. This research provides insight into the potential of ChatGPT as a tool in learning programming and provides practical solutions for users.

Keywords: ChatGPT, Learning, Programming

1 INTRODUCTION

Artificial Intelligence (AI) is a trending technology today and is used in several sectors such as education (Gill et al., 2023). Technology is currently undergoing very rapid development which can be used in solving cognitive problems that are generally related to human intelligence, such as learning, problem solving, and pattern recognition (Fitria, 2021). The application of AI technology is currently starting to penetrate several forms, for example used in word processing, sound, image processing, video manipulation and several concepts of artificial intelligence in the computer field. AI technology can answer and solve problems that they think are correct, they can answer by comparing questions with very large datasets to improve their training algorithms (Van Dis et al., 2023); (Lund & Wang, 2023); (Kung et al., 2023).

ChatGPT is one of the most phenomenal Chatbots that has galvanized netizens in the internet world which was released in November 2022 among professionals, students, policy makers,

and experts in the field of higher education (Barrot, 2023). ChatGPT uses AI and Natural Language Processing (NLP) that can process questions into human-like answers. ChatGPT has a high level of intelligence and excels in the aspect of writing an answer but lacks emotional depth and life experience. In addition, it has limited capabilities in content accuracy, contextualization, common sense, and emotions generated, but even so this tool is able to present opportunities in providing direction and answers to user questions (Gill et al., 2023). This is evidenced by the more than 100 million users who have used this tool since it was first introduced (Seghier, 2023).

The development of AI technology has increased the accessibility, scalability, and efficacy of text generation tools, especially the ChatGPT App (Zhou et al., 2022). Ai applications can be very important for colleges and universities, whether for learning support tools, management operational support, or learning systems. The use of AI can reduce operational costs and improve student learning outcomes (Gill et al., 2023). Although there are concerns that students misuse this technology to do their tasks that should be done independently (Sullivan et al., 2023). Some studies reveal the effects of using ChatGPT in the classroom can provide content that can be used to answer assignments so that many students copy, get wrong answers, and inappropriate reference answers (J. C. Lin et al., 2023); (Zivelonghi & Giuseppi, 2023); (Seghier, 2023); (Zawacki-Richter et al., 2019). Despite these fears, the proper use of ChatGPT coupled with support or direction from the teacher can help students in enriching the desired subject matter, students can get appropriate advice if they can use it according to the right instructions. Teachers can also improve lessons, teaching methods, and management of the learning environment through the help of AI (Gill & Kaur, 2023).

In the field of computer programming, users utilize ChatGPT to explore programming languages, algorithms, and data structures. AI technology on ChatGPT can address challenges such as code synthesis from descriptions, program improvement, and natural language summarization for computer programs (Lund & Wang, 2023); (Phillips et al., 2022). In his research (Tian et al., 2023) revealed that ChatGPT can effectively handle common problems in ordinary programming, but sometimes ChatGPT is difficult to translate user desires in creating a complex program structure. In the study also found interesting things that ChatGPT can provide valuable insights that can be used for the future.

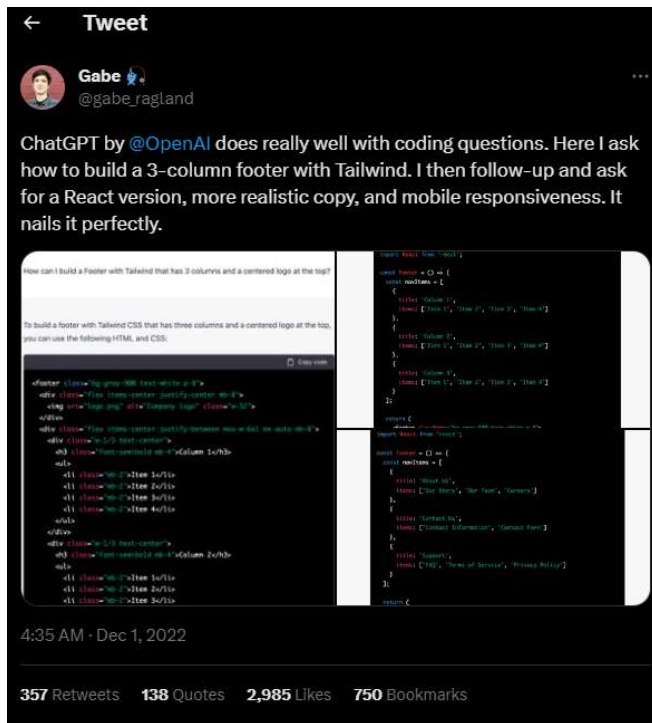


Figure 1 Twitter Account @gabe_ragland

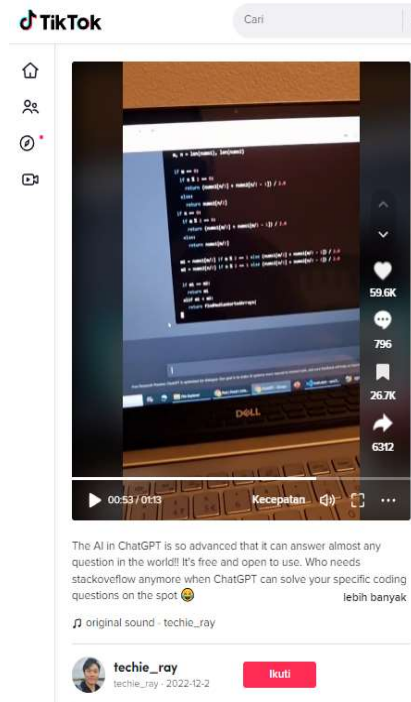


Figure 2 Twitter Account
techie_ray

The use of ChatGPT for programming is not only demonstrated by researchers, but some enterprising social media influencers explain the benefits of using ChatGPT to assist in programming such as the @gabe_ragland account on his Twitter account revealing that ChatGPT can create program code well. This is in line with the expression conveyed by techie_ray in his Tiktok account which states that ChatGPT is a sophisticated application because it can solve specific program code questions. Based on this background, the purpose of this research is to explore AI technology on ChatGPT for programming learning.

2 METHODOLOGY

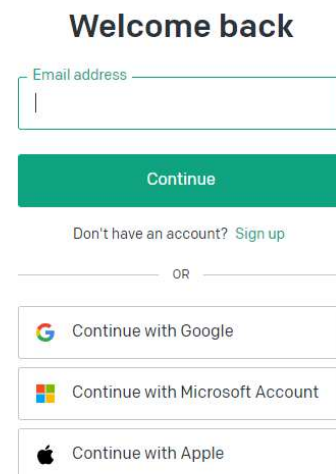
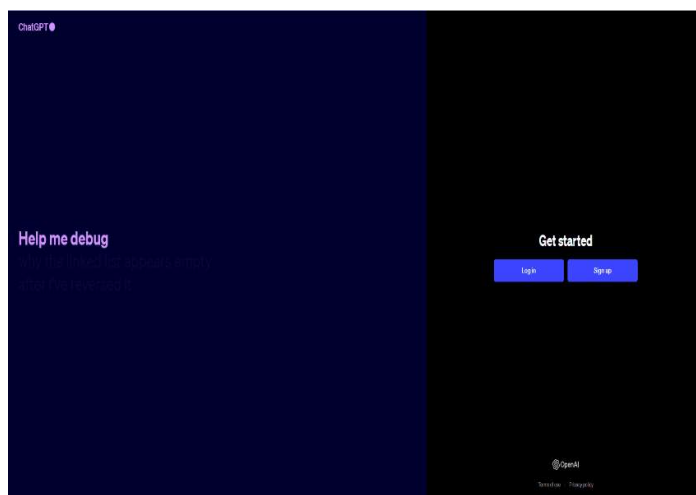
The method used in this research is descriptive qualitative method. The use of this method emphasizes the observation of the phenomenon being studied. The sharpness of analysis when examining the substance becomes an important point that is described in words or sentences that are explained. The approach to research does not use statistical tools but is more directed into hypotheses (Privitera & Ahlgrim-Delzell, 2018). In this study, researchers explained the use of AI technology on ChatGPT for programming learning.

In this study using documents and observations. Documents are tools that can record so that the results can be analyzed (Altheide & Schneider, 2012). The types of documents used in this study are posts on Twitter and Tik Tok. Observation is carried out to directly observe the elements to be studied (Madondo, 2021). In this study, researchers will simulate how to use ChatGPT in supporting the learning process in programming courses.

3 FINDINGS AND DISCUSSION

3.1 Findings

Since its inception in 2022 this application has become very popular and has invited many enthusiastic users to try to explore its capabilities. Several users on Twitter and Tik Tok have reviewed and praised its greatness in providing comprehensive written information. Some users even mentioned that ChatGPT is better than Google because it can answer all the questions asked, unlike Google which can only index related web pages that match the keywords we enter. The use of ChatGPT can be used to write code, draft blog posts, write academic essays, and compile work reports. OpenAI, which is a company in the development of ChatGPT, said that the machine uses Reinforcement Learning from Human Feedback (RLHF) technology. The use of ChatGPT can help in solving everyday problems, currently ChatGPT is most widely used to write E-mail and create program code (P. Lin, 2023). How to use ChatGPT is relatively easy, namely by opening a browser then visiting the web page <https://openai.com/> or <https://chat.openai.com/>.



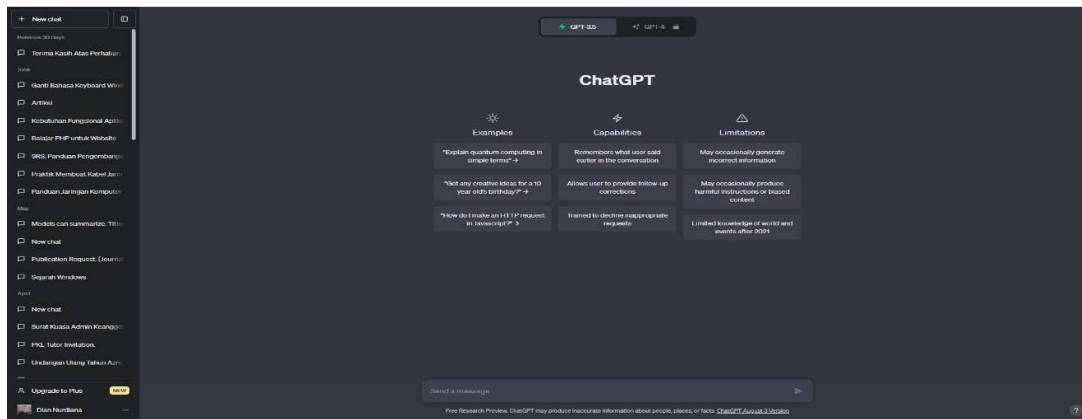


Figure 3 ChatGPT Website Page

Users can first register for an account or use an existing email account such as Google, Microsoft, or use an Apple account. At the time of registration, users can choose the private user option, the next step is to enter the confirmation number entered into the registration page. After having an account, users can directly login and write the chat questions they want to ask in the column at the bottom of the main page.

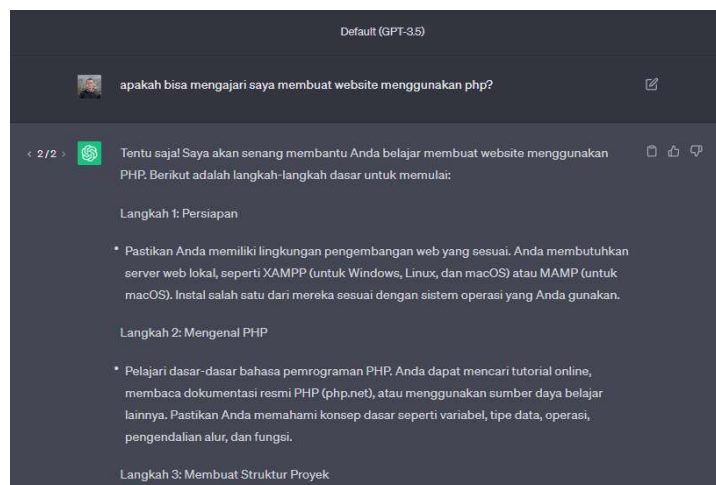


Figure 4 Starting A Question On ChatGPT

Figure 4 shows the first question asked to ChatGPT. The default language used is English, but users can also ask using Indonesian. The answer given by ChatGPT will also use Indonesian that can be understood even though the language is the result of processing from AI machines. In this research, the first question asked was "Can you teach me to make a website using php?". Then the machine answers "Of course! I will be happy to help you learn to create a website

using PHP", not only that the machine also provides steps that must be started to create a website using PHP such as Step 1: Preparation which explains the need for a local server that must be installed by the user such as XAMPP (for Windows, Linux, and macOS) or MAMP (for macOS). Step 2: Getting to Know PHP which explains the basics of PHP programming, the machine recommends learning first on the php.net page, besides that users are also asked to understand about variables, data types, operations, flow control, and functions. Step 3: Creating a Project Structure which explains the steps to create the main file with the ".php" extension. For example, "index.php" or "home.php". This file will be the starting point of your website. Step 4: Writing PHP Code explains how to get started in writing PHP and HTML code to build a website layout. Step 5: Testing Your Website Locally explains how to run your local web server (for example, Apache) and access your website through a browser using the URL <http://localhost/nama-proyek-anda/index.php>. You can now view and test your website locally. Step 6: Adding Features which explains the additional features that can be used such as MySQL. Step 7: Website Deployment which explains the final stage in website development which is uploading it to a public web server so that it can be accessed by other users on the internet. Some of these steps are the basic understanding that must be possessed when wanting to learn to create a website using PHP. This is also emphasized by the machine by providing the following explanation "Those are the basic steps to create a website using PHP. Of course, there are many things you can learn further to master PHP and develop more complex websites. However, by understanding these basics, you can already start creating a simple website with PHP. Happy learning!"

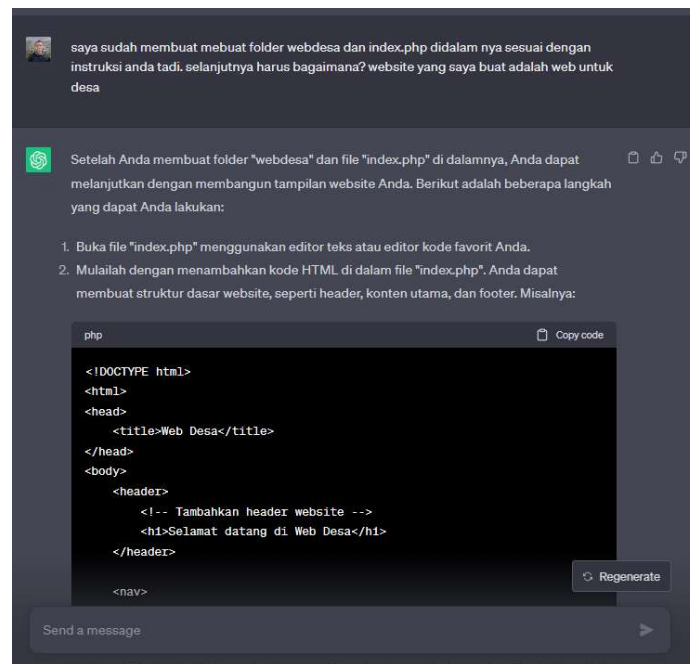


Figure 5 Second Question On ChatGPT

After understanding and implementing the previous step, then in Figure 5 the researcher asked the next step in making a website, besides that the researcher explained the specification of the website that he wanted to make, namely the village website by making the question "I have created the webdesa folder and index.php in it according to your instructions earlier. "What should I do next? The website I made is a website for the village". Then the machine answered as follows:

"Once you have created the "webdesa" folder and the "index.php" file in it, you can proceed with building the appearance of your website. Here are some steps you can take:

1. Open the "index.php" file using a text editor or your favorite code editor.
2. Start by adding HTML code inside the "index.php" file. You can create the basic structure of the website, such as header, main content, and footer. For example:

```
<!DOCTYPE html>
<html>
<head>
  <title>Web Desa</title>
</head>
```

```
<body>
  <header>
    <!-- Tambahkan header website -->
    <h1>Selamat datang di Web Desa</h1>
  </header>

  <nav>
    <!-- Tambahkan navigasi website -->
    <ul>
      <li><a href="#">Beranda</a></li>
      <li><a href="#">Tentang Desa</a></li>
      <li><a href="#">Galeri</a></li>
      <li><a href="#">Kontak</a></li>
    </ul>
  </nav>

  <main>
    <!-- Tambahkan konten utama website -->
    <h2>Selamat datang di Desa Kami</h2>
    <p>Ini adalah website resmi Desa XYZ yang memberikan informasi terkini
tentang desa kami.</p>
  </main>

  <footer>
    <!-- Tambahkan footer website -->
    <p>Hak Cipta &copy; 2023 Web Desa. Hak Cipta Dilindungi.</p>
  </footer>
</body>
</html>
```


3. Customize the website content according to your village's needs. You can add information about the village, photo galleries, contacts, or other relevant features.
4. Save the changes to the "index.php" file.
5. Open a browser and access your website with the URL "http://localhost/webdesa/index.php" or customize the URL with the folder and file names you created.

With the steps above, you have created a basic look for your village website using PHP. You can continue by adding other features, such as a contact form, retrieving data from a database, or other pages needed for the village website.

Congratulations on developing your village website! If you have any further questions, don't hesitate to ask."

The result of the program code created by ChatGPT is as follows:

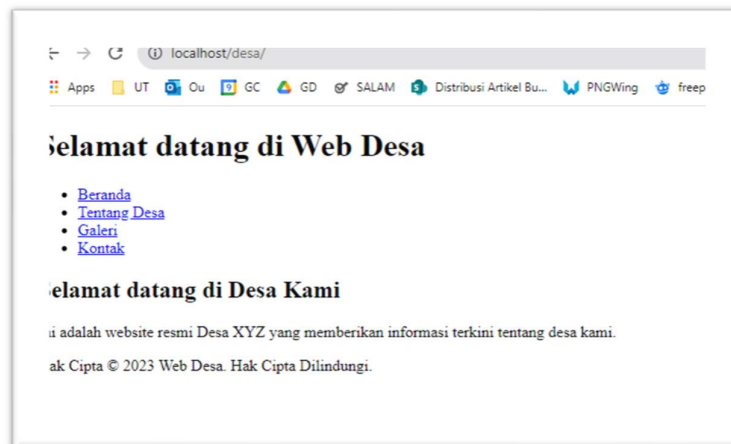


Figure 6 ChatGPT Result Web Page

In Figure 6 we can see the website page resulting from the code generated by ChatGPT, but on that page the results are not so good, it still looks very simply. For this reason, the researcher made a follow-up question, namely "I want it to look better" then ChatGPT answered "Of course, there are several ways to improve the appearance of your village website. Here are some tips to make it look better".

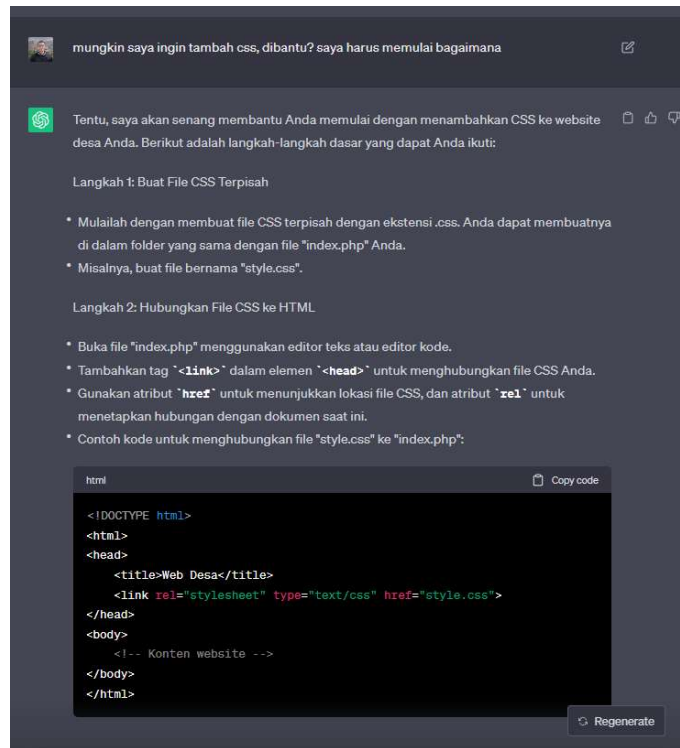


Figure 7 Third Question On ChatGPT

In Figure 7, the researcher asks how to add CSS code to make the village website look better, then the machine provides a very helpful answer by providing the requested CSS program code.

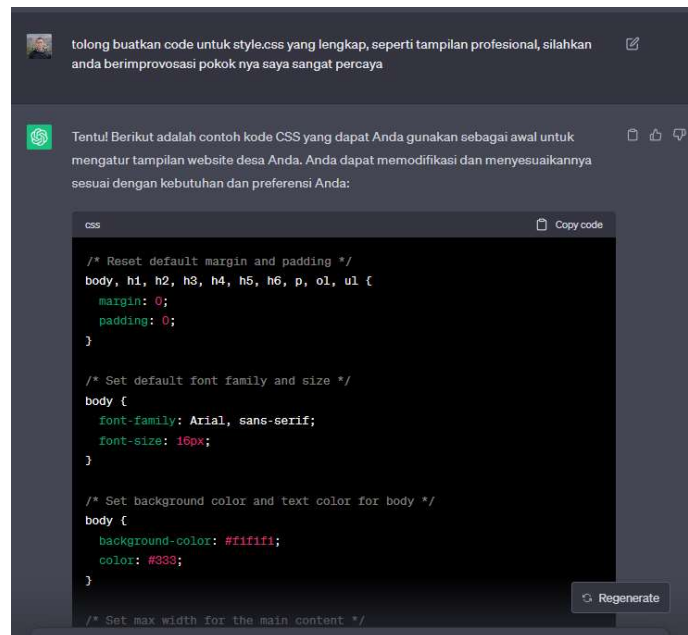
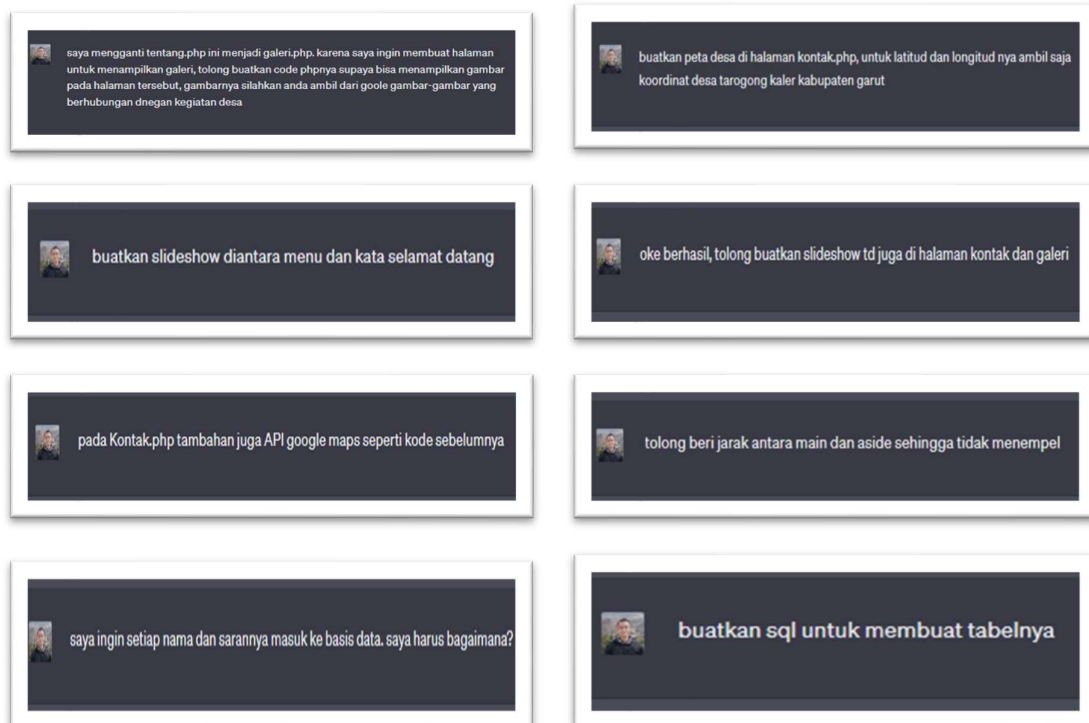


Figure 8 Fourth Question On ChatGPT

Figure 8 explains the follow-up questions related to the use of CSS code. At this stage the researcher asked more specifically as follows "Please make the code for style.css complete, like a professional look, please improvise the point I really believe". The ChatGPT engine can answer this question by providing a more complete CSS program code so that it looks better. In addition, the ChatGPT engine also provides an explanation of each CSS program code it creates as follows:

"In the example above, CSS rules have been added to reset default margins and padding, set font styles, set background colors, and set the appearance of elements such as headers, navigation, main content, and footers. Also, there are media queries to customize the display for devices with a maximum screen width of 768px or less, such as tablets and phones. You can copy and paste the code into your "style.css" file, and then modify it according to your needs. You can add more CSS rules or change existing properties to achieve a look that suits your village's preferences. Feel free to explore and adapt the style to suit your village's image. If you need further assistance or have anything else you want to ask, don't hesitate to ask!"



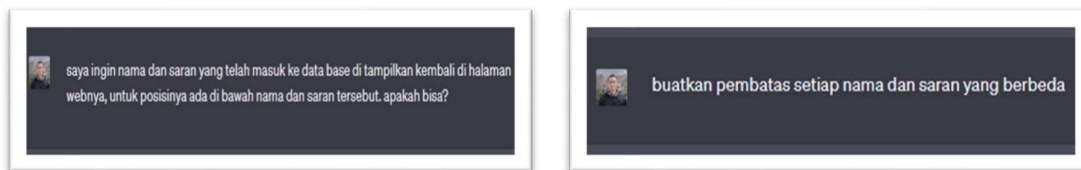
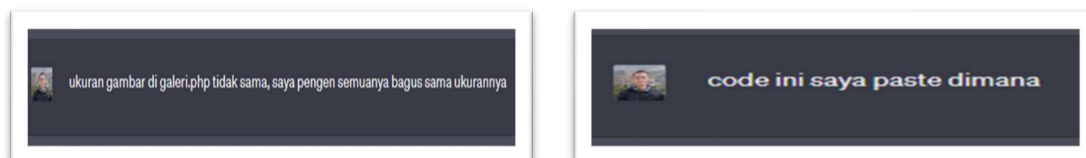


Figure 8 Questions About Adding Features During Website Development On ChatGPT

Figure 8 explains some of the follow-up questions asked by the researcher to make the village website look as desired. In these questions the researcher asks for code and explanations about features that can be added to the website rather than getting better, these questions include."

1. "I changed about.php to gallery.php. because I want to make a page to display the gallery, please make the php code so that it can display images on the page, the images please take from the google images related to village activities."
2. "Create a village map on the contact.php page, for latitude and longitude just take the coordinates of the village of tarogong kaler garut district."
3. "Create a slideshow between the menu and the word welcome."
4. "Okay it works, please also create a slideshow on the contact page and gallery."
5. "In Contact.php also add the google maps API like the previous code"
6. "Please put some space between main and aside so it doesn't stick."
7. "I want every name and suggestion to go into the database. what should I do?"
8. "Create the sql to create the table."
9. "I want the names and suggestions that have been entered into the database to be displayed again on the web page, for the position to be below the names and suggestions. is it possible?"
10. "Make a delimiter for each different name and suggestion."



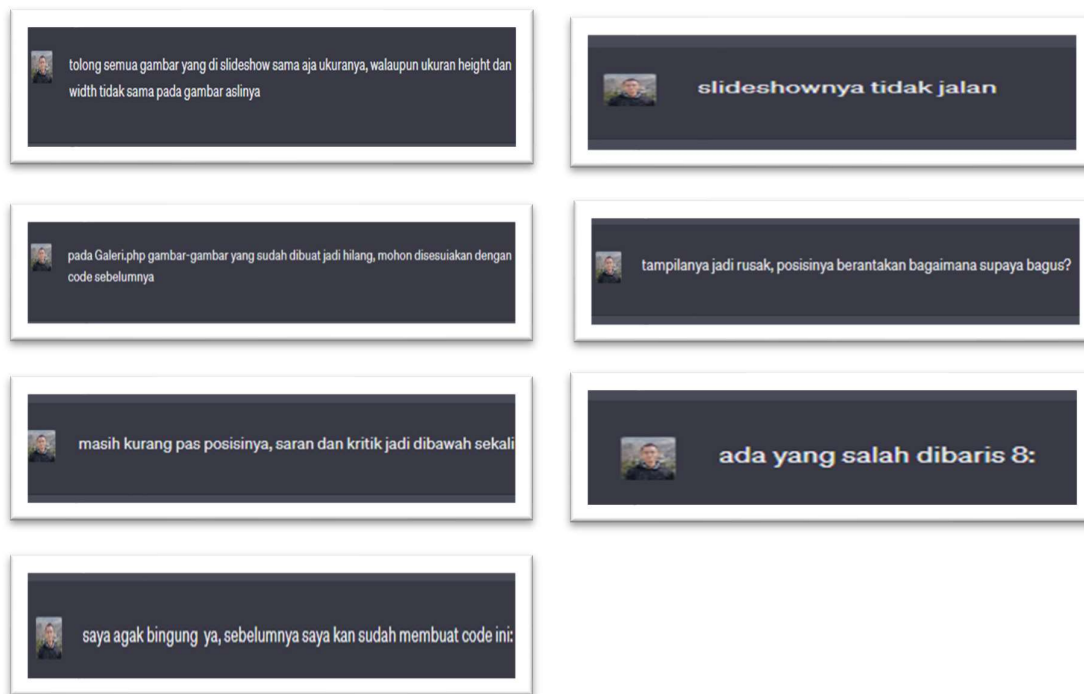


Figure 9 Problem Solution Questions During Website Development On ChatGPT

Figure 9 describes questions related to error handling during village website development. ChatGPT not only provides solutions for adding features during development but can also be a mentor for users if there are problems or results that are not as desired. Each answer given by the machine will be equipped with explanations that we can understand. Here are some questions related to the problems experienced during the development of the village website.

1. "The image size in gallery.php is not the same, I want everything to be the same size.
2. "Where do I paste this code"
3. "Please all images in the slideshow are the same size, even though the height and width sizes are not the same in the original image."
4. "The slideshow is not working."
5. "In Gallery.php the images that have been made are missing, please adjust the previous code."
6. "The display is broken, the position is messy, how to make it good?"
7. "The position is still not right; suggestions and criticism are very welcome."
8. "Something is wrong in line 8"

9. "I'm a bit confused, before I already made this code:"



Figure 10 Village Website Page

Figure 10 is a village website page that has been created with the help of ChatGPT. On the page there are several menus, namely Home, Gallery, and Contact. On the Home menu there is information about the village, then there is a column of suggestions and criticisms that visitors can fill in by writing their names and suggestions in the column provided. Any visitor feedback will be displayed on this page. On the Gallery page there are photos of activities carried out by the village community. Meanwhile, on the Contact page there are contacts from the village profile equipped with a map showing the location of the village. In addition, there is a slideshow that can beautify the website pages that have been made.

3.2 Discussion

Chat Generative Pre-Trained Transformer or ChatGPT is an AI-based platform developed by OpenAI in the United States in November 2022. The beginning of its appearance became one of the phenomenal ones because it was able to introduce the AI that is aspired to today. ChatGPT is powered by advanced computing technology and a large enough amount of

information to be able to understand the context of the question and answer the question relevantly. ChatGPT can be accessed through several platforms such as mobile devices and PC computers. Users can open a browser and access the page <https://chat.openai.com/auth/login> to create an account first. After creating an account verify via email or mobile phone the user to start using ChatGPT, type your question or request in the search box at the bottom of the main page.

ChatGPT works like a human, providing information from a range of knowledge and writing it back like human-like writing. ChatGPT's knowledge base comes from a variety of domains, genres and sources, including books, articles, websites and other online content (Barrot, 2023). ChatGPT can log every previous conversation, correcting itself so that users can also respond differently to the results provided. In addition, ChatGPT can capture information in the form of language style and emotions written by its users. The resulting text is usually coherent and grammatically correct, making it a very useful tool for improving the user's writing. ChatGPT can also generate essay topics based on the areas of interest queried by the user.

With the ability to provide all the information needed, ChatGPT can be a learning tool in higher education and training (Baidoo-Anu & Owusu Ansah, 2023); (Kasneci et al., 2023). (1) In the case of learning in the development of village websites, ChatGPT can be used as reference material or information on website development according to user wishes, in this case the user wants to create using the PHP programming language with several features on the website. (2) ChatGPT can be used as a virtual mentor who helps students like a practitioner or lecturer, ChatGPT can help with existing problems by providing guidance and explanation of the material being studied. (3) ChatGPT can be an idea material for students who are studying, ChatGPT can provide many references related to the student's field of interest. A good ability to understand the questions asked by students is one of the important points of ChatGPT's success in providing appropriate feedback or answers. ChatGPT can recognize language varieties as well as active and passive language writing procedures well, although the default language is English, but users can use everyday language or language that is understood by them.

Learning programming is quite complex, in addition to understanding the programming language used, students must also be able to solve bug problems in program code. Bugs are common and must be solved when we are creating program code. Sometimes students need a

long time to solve a bug. The role of mentors or lecturers in learning programming is to provide direction and assistance when students experience this. The advantage of ChatGPT is that this machine can recognize and assist students in solving bugs in program code (Surameery & Shakor, 2023). The sophistication of ChatGPT in resolving bugs in program code is obtained from large data sources, where ChatGPT can understand code snippets, bug reports and information about software development. This support allows the machine to associate the relationship of program code with existing bugs. In addition, the debugging process in providing answers to program code can be more quickly reported to users (Fill et al., 2023).

ChatGPT can be used to help describe program code, explaining the stages of program code development requested by users. Program code is reported according to the user's level of understanding. The more advanced the user is, the more complex the answer report provided by ChatGPT, although users need to pay more attention to details related to the effectiveness of the program code provided by ChatGPT. However, for ordinary users who are learning basic programming, the use of ChatGPT will be very helpful as if they get a virtual mentor, ChatGPT will provide an easy-to-understand and structured explanation. When students lack understanding or errors occur, they can directly discuss with the machine. ChatGPT can provide suggestions that match the commands entered by the user. For example, when the user feels that the appearance of the website is not as desired, the user just needs to explain in detail to ChatGPT. ChatGPT's ability to remember the history of conversations with users can help in understanding the needs and intentions of users as a whole. The program code created will be connected to each other based on the results of previous conversations, so that students who will learn can continue the material they have learned at a later time. ChatGPT can recognize the user's emotions based on the sentences delivered, so ChatGPT's response to users who do not understand or ask for a more in-depth explanation can be understood by ChatGPT by responding to humane explanations just like we chat with humans.

The presence of ChatGPT in the current era can have both positive and negative impacts on higher education and training programs. Educational institutions should be able to utilize the opportunity of ChatGPT's sophistication to assist in the learning process, especially in programming materials. The combined use of ChatGPT and the support of mentors or lecturers in educational institutions will make it easier for students to learn. However, it is necessary to make rules or ethics in the use of ChatGPT in the educational environment. As with a knife that

has 2 sharp sides, depending on who and how to use it. The more able to use it, it will lead to a good direction and vice versa.

4 CONCLUSION

The development of Chat Generative Pre-Trained Transformer or ChatGPT technology is increasingly rapid and easy to use to become one of the most widely used applications today. Users can use it for free by visiting the page <https://openai.com/> or <https://chat.openai.com/> in the browser then logging in, after successfully logging in the user can then ask questions to ChatGPT as well as chatting with humans. ChatGPT will provide answers according to the questions asked by the user. The user asks, "Can you teach me to make a website using php?". In a split second the app can answer "Of course! I would love to help you learn how to build a website using PHP". With a series of questions about how to create a village website using PHP, the machine can eventually help the user in creating the desired website. Not only that, during the creation process the machine can also become a mentor and help users when experiencing difficulties in implementing program code with a comprehensive explanation as a mentor assists his students. ChatGPT technology uses a sophisticated AI engine to understand questions or just chat like with friends, the more detailed the questions we make, the more detailed the machine can provide answers. This sophistication is very useful for students because it can balance the needs and understanding of students in learning programming. ChatGPT can save the history of conversations during learning, so that students can continue anytime and anywhere when students want to continue the learning process.

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