CHAPTER 8
CONCLUSION

This chapter discusses overall conclusion of the development and implementation of ARITHELP. It has achieved and fulfills the requirements and objectives as determined during system analysis. Section 8.1 covers on the problem facing and its solutions during the implementation of the system. Section 8.2 highlights the strengths of the system. Section 8.3 discusses the limitations of the system. Section 8.4 will look on the future enhancements of the system. Section 8.5 briefly discusses on the conclusion of the system.

8.1 PROBLEM AND SOLUTION
During the development of the whole system, there are several problems that have been encountered. Some solution has been identified to enable the system to work smoothly.

8.1.1 Difficulty in choosing a software
As this project has to be developed by applying the multimedia features, a lot of problems have been encountered to find the exact software that support the features. Some software has support for several features that another may not. Comparisons were made among various multimedia software to identify the software that has more multimedia features in order to produce an interactive courseware. The software looked at were Authorware, ToolBook II Instructor, HTML, Asymetrix Librarian and Shockwave.

8.1.2 Problems and solution during system implementation
There was a problem that cannot be detected during the selection of the software. The problem only occurs when the software is going to be implemented. As such, the system cannot be implemented over the Internet since the system did not support by HTML (Hypertext Mark-up Language). In order to proceed, the system is implemented as a standalone system. Furthermore, it can be delivered in the CD-ROM format where the users can access it at anywhere and anytime.
8.2 SYSTEM STRENGTHS

8.2.1 Detailed Feedback
The greatest strength of ARITHELP is the ability to generate highly detailed feedback about problem solving. Generally, the richer the more accurate the diagnosis of errors. Therefore, more accurate diagnosis results in faster learning.

8.2.2 User Friendly
ARITHELP is user-friendly. The user can easily understand and recognize the button provided in the system. There are also pop up fields, which appear for the graphics button explaining its function.

8.2.3 Fast Response
ARITHELP provides fast response for user requirement with interactive interfaces. The user is only required to press several buttons to find their information. They can solve the problem encountered in a few minutes.

8.3 SYSTEM LIMITATIONS

8.3.1 System Performance depend on the CPU speed
ARITHELP was developed using multimedia concepts, which occupy large hard disk space. However, the computers commonly used by students are not sophisticated enough to handle at an acceptable speed, the complex tasks required by ARITHELP. Therefore, the high speed of CPU is required to run the system smoothly. Otherwise, the system performance becomes weak and cannot response to the user immediately.
8.3.2 Software limitation
Although ToolBook II instructor book can be exported as HTML, there are however, some fundamental restrictions imposed by the current HTML standard. Consequently, not all objects supported by ToolBook II will be exported to an HTML equivalent. Following are shown the object which is and is not supported by HTML:-

1. Object types supported in HTML
   - Text fields
   - Record fields
   - Buttons
   - Paint objects
   - Picture objects

2. Object types not supported in HTML
   - CD Audio
   - Video disc
   - Video tape
   - Open script
   - ToolBook II draw object (lines, rectangles, etc)

8.3.3 Cost of multimedia hardware and software
Several financial decisions need to be made concerning the authoring tool, the computer system and extra hardware and software needed to produce a multimedia project. Not all the features required to support system development can be found easily. In addition, it is costly to buy additional hardware and software.
8.4 FUTURE ENHANCEMENTS

8.4.1 Implement over the Internet
It is suggested that ARITHELP be implemented over the Wide Area Network by using other software that can support multimedia. Therefore, it can be viewed by more users freely on their own time, space and pace.

8.4.2 Input Systems
The system can also be improved with several new technologies. For example, an input system that can allow students to enter their problems orally. Hand-writers input systems can only allow them to enter as they usually do in their manual problem solution. At present, this technology may not be good enough to handle the complex input task for the ARITHELP. With time, it would become a reality.

8.4.3 Collaborative Helping
Collaborative help refers to students working in groups and helping each other to solve problems. These environments have been shown to be beneficial, both cognitively and socially. In these situations, the focus of the interactions is not only between the teacher and the students, as students can teach and help each other without input from the instructor. For the purpose of this discussion, the term collaborative learning refer to student working together, with the aid of an ARITHELP, via a computer network.

8.4.4 Improved interfaces, bandwidth, and visual representations.
Improving the performance of ARITHELP by keeping the same underlying ARITHELP and exploiting better, more user-friendly and graphical user interface (GUI). Simpler communication between student and helper, higher bandwidth dialogue and visual explanations that are easy to understand as well as entertainment may enhance learning outcomes substantially. Indeed, in the short-term it is very likely that better interface design will contribute more to improve the effectiveness of ARITHELP and enrich the expertise underlying their reasoning.
8.5 CONCLUSION
As a conclusion, ARITHELP has been successfully developed. However, there are some limitations which cannot be applied within the system as described in 8.3 System Limitation. The limitation can be considered for future enhancement to make the system more intelligent and attractive.