CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

A computer-aided learning system for unit operation has been developed to run under Microsoft Windows. Seven basic unit operations selected to study include Filtration, Sedimentation, Sieve Analysis, Efflux Time of a Tank, Flow in Pipe, Fluidization, and Mixing. Any units can be selected by the user via Graphic User Interfaces. Each developed unit has two main sections, calculation and theory sections. The results of the simple simulation in the calculation section were demonstrated numerically and graphically. The theory section provides detail on the theory of the selected unit. The user can use this section to study the theory by navigating through the section by hot spots. It is convenient for Thai who want to study unit operations by using this CAL, because it provides the theory of all unit operations in Thai .

The accuracy of the results from the calculation section were tested by comparing with other calculation methods, for example, Microsoft Excel and hand calculation. On the same basis and the same equations used, it is found that there is no significant difference in calculation results among the program and other methods.

The main advantages of this CAL are (1) the user can easily learn Chemical Engineering Unit Operation by himself, (2) there are a lot of colorful graphics attracting users to use, (3) the useful hot spots and keywords help the user to search the interesting topics, (4) a lot of time will be saved in getting the calculation results.

5.2 Recommendations

Some limitations of this study have been found. The calculation section is based on the laboratory direction in Unit Operation I (laboratory) subject, which is a course in Department of Chemical Engineering, Faculty of Engineering, Chulalongkorn University. Some modules, such as Flow in Pipe Unit, Fluidization Unit, Mixing Unit and Efflux Time of a Tank Unit, can be used within a limited range, because it is specific for laboratory scaled equipments. However, this CAL can be applied to the similar system having the same operating conditions and it is able to collect all data required by this package. The remaining units, Filtration Unit, Sedimentation Unit, and Sieve Analysis Unit, can be used more generally.

This software is a prototype, so it has only simple calculations and basic theory of each unit operation. Further development to be conducted for developing this CAL is as follows:

1. Modifying calculation section for more complicated system.

2. Modifying Graphic User Interface.

3. Using multimedia, such as sound, to attract the user.

4. Creating graphic animation.

5. Adding more data base in theory section.