Facilitating student understanding of Internetworking via e-learning

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TRITA xxx yyyy-nn

Abstract

- e-learning, lms, capabilites
- Importance of hands on training, lack of online exercises for internetworking
- briefly mention the goals / outcome of the thesis

Learning Management Systems (LMS) are widely used in higher education to improve the learning, teaching and administration tasks for students and instructors. Such systems enrich the educational experience by integrating a wide range of services ~~like~~ on-demand course material and training, empowering students to achieve their learning outcomes at their own pace.

Courses in fields of Computer Science that provide rich ~~E~~lectronic learning (e-learning) experience depend on exercise material offered in forms of quizzes, programming exercises, laboratories etc. Providing hands on experience in courses such as Internetworking ~~depends on~~ laboratory exercises based on virtual machine environments where the student ~~implements and~~ studies the performance of different internet protocols. The integration of ~~these~~ exercises and their tailored virtual environments is not very popular in LMS.

~~We~~ investigate the generation of on-demand virtual exercise environments using cloud infrastructures and integration with LMS to provide a rich e-learning Internetworking course.

Referat

Acknowledgements

I would like to acknowledge ~~my adviser's help in getting access to the necessary packet traffic at a commercial operator (who should be thanked but must remain unnamed)~~.

Contents

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List of Acronyms and Abbreviations

e-learning Electronic learning

LMS Learning Management System

Chapter 1

Introduction

This chapter describes the specific problem that this thesis addresses, the context of the problem, the goals of this thesis project, and outlines the structure of the thesis.
Give a general introduction to the area. (Remember to use appropriate references in this and all other sections.trans

- LMS and how its functionality helps teaching and learning

- Internetworking definition, course goals, and show how hands on practice help to better achieve the course learning outcomes.

- Mention that specific course exercises are not supported as a service from LMS.

[1],[2],[3],[4],[5],[6]

1.1 Background

How much info should go before the sections of the chapter?

Set the problem context for your project.
(Give detailed background information in Chapter 2.)
Sometimes it is useful to insert a system diagram here so that the reader knows what are the different elements and their relationship to each other. This also introduces the names/terms/? that you are going to use throughout your thesis (be consistent). This figure will also help you later delimit what you are going to do and what others have done or will do.

- Some of the information mentioned in introduction should be moved here.

- This should provide sufficient information (details are in the next chapter) to understand the problem statement, purpose and goals sections.

- focus on the current type of exercises and how they are performed?

1.2 Problem definition

Longer problem statement

Courses in fields of Computer Science that provide rich Electronic learning (e-learning) experience depend on exercise material offered in forms of quizzes, programming exercises, laboratories etc. Providing hands on experience in courses such as Internetworking depends on laboratory exercises based on virtual machine environments where the student implements and studies the performance of different internet protocols. The integration of these exercises and their tailored virtual environments is not very popular in Learning Management System (LMS).

embarrasing problem statement

1.3 Purpose

State the purpose of your thesis and the purpose of your degree project. Describe who benefits and how they benefit if you achieve your goals. Include anticipated ethical, sustainability, social issues, etc. related to your project. (Return to these in your reflections in Section 6.4.)

We aim to generate a software infrastructure that supports instantiation of on-demand exercise environments using cloud based technologies that will enrich the learning experience of students, facilitate student's achieving the course outcomes of Internetworking while maximizing their ability to proceed at their own pace. We want to generate such exercise environments dynamically and allow professors to customize them according to different exercise's requirements.

more epmpasis on students and bring LMS into this

1.4 Goals

State the goal/goals of this degree project.

- Software that integrates with Canvas and hosts on demand virtual instances that run tailored course exercises

- Break the above into subgoals, and make sense.

1.5 Research Methodology

Introduce your choice of methodology and method ? and the reason why you chose them. Contrast them with and explain why you did not choose other methodologies or methods. (The details of the actual methodology and method you have chosen will be given in Chapter 3.)

1.6 Deliminations

> Describe the boundary/limits of your thesis project and what you are explicitly not going to do. This will help you bound your efforts ? as you have clearly defined what is out of the scope of this thesis project.

- Scalability of the designed system regarding number of users is out of the scope.

- Extensibility for other courses is out of the scope.

- Supporting other than LTI standars or different LMS is also out of the scope.

1.7 Structure of the thesis

> Chapter 2 presents relevant background information about xxx. Chapter 3 presents the methodology and method used to solve the problem. ?

Chapter 2

Background

What does a reader (another x student – where x is your study line) need to know to understand your report? What have others already done? (This is the ?related work?.)

...

What goes here? Maybe intro for the sections of this chaper?

2.1 Background area 1

- What is LMS? What features do they offer to achieve the course learning outcomes?

- What is the LTI? How are they used to connect external services with Canvas LMS?

2.2 Background area 2

- What are the exercise ~~requirements~~?

- How are these requirements met by the chosen technologies?

2.3 Related work

- EduRange project

- other LTI integrations that try to address similar concepts?

2.3.1 EduRange

why is our solution similar or different than theirs? (In terms of software, and of course supported exercise material)

2.3.2 Related work 2

...

2.4 Summary

It is nice to bring this chapter to a close with a summary. For example, you might include a table that summarizes the ideas of others and the advantages and disadvantages of each ? so that later you can compare your solution to each of these. This will also help guide you in defining the metrics that you will use for your evaluation.

Chapter 3

Methodology

What scientific or engineering methodology are you going to use and why have you chosen this method. What other methods did you consider and why did you reject them. What are your goals? (What should you be able to do as a result of your solution - which could not be done well before you started?) What you are going to do? How? Why? For example, if you have implemented an artifact what did you do and why? How will your evaluate it.

3.1   Research Process

3.2   Research Paradigm

3.3   Data collection

(This should also show that you are aware of the social and ethical concerns that might be relevant to your data collection method.).

3.3.1   Sampling

3.3.2   Sample size

3.3.3   Target Population

3.4   Experimental design

3.4.1   Test environment

3.4.2   Hardware/Software to be used

3.5   Assessing reliability and validity of the data collected

3.5.1   Reliability

3.5.2   Validity

3.6   Planned Data Analysis

3.6.1   Data Analysis Technique

3.6.2   Software Tools

3.7   Evaluation Framework

Chapter 4

Implementation

Chapter 5

Analysis

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5.1 Major results

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5.2 Reliability Analysis

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5.3 Validity Analysis

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5.4 Discussion

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Chapter 6

Conclusions and Future Work

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6.1 Conclusions

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6.2 Limitations

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6.3 Future work

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6.4 Reflections

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References

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Appendix A

Appendix Name X

content X