



INTED 2014 CONFERENCE

**The Educational Learning
Lifecycle and the Cloud
Computing**

**Ana Gonzalo Nuño
Concepción M. Gascueña**



The Educational Learning Lifecycle and the Cloud Computing

Contents



- Introduction
- Motivation
- Objectives
- Our Proposal
- Conclusions and Future Works



Introduction



Introduction

- Motivation
- Objectives
- Our Proposal
- Conclusions
- Future Work

The academic failure of university students leading them to dropout is a concern among universities; and among those who invest time and money to investigate the causes of such failure.

However, few solutions, that could serve **all students** and **tackle the related problems**, have been proposed so far.

One such problem is caused by the lack of the "*knowledge chain educational links*" that occurs when students move onto higher studies without mastering their basic studies.



Introduction



Introduction

- Motivation
- Objectives
- Our Proposal
- Conclusions
- Future Work

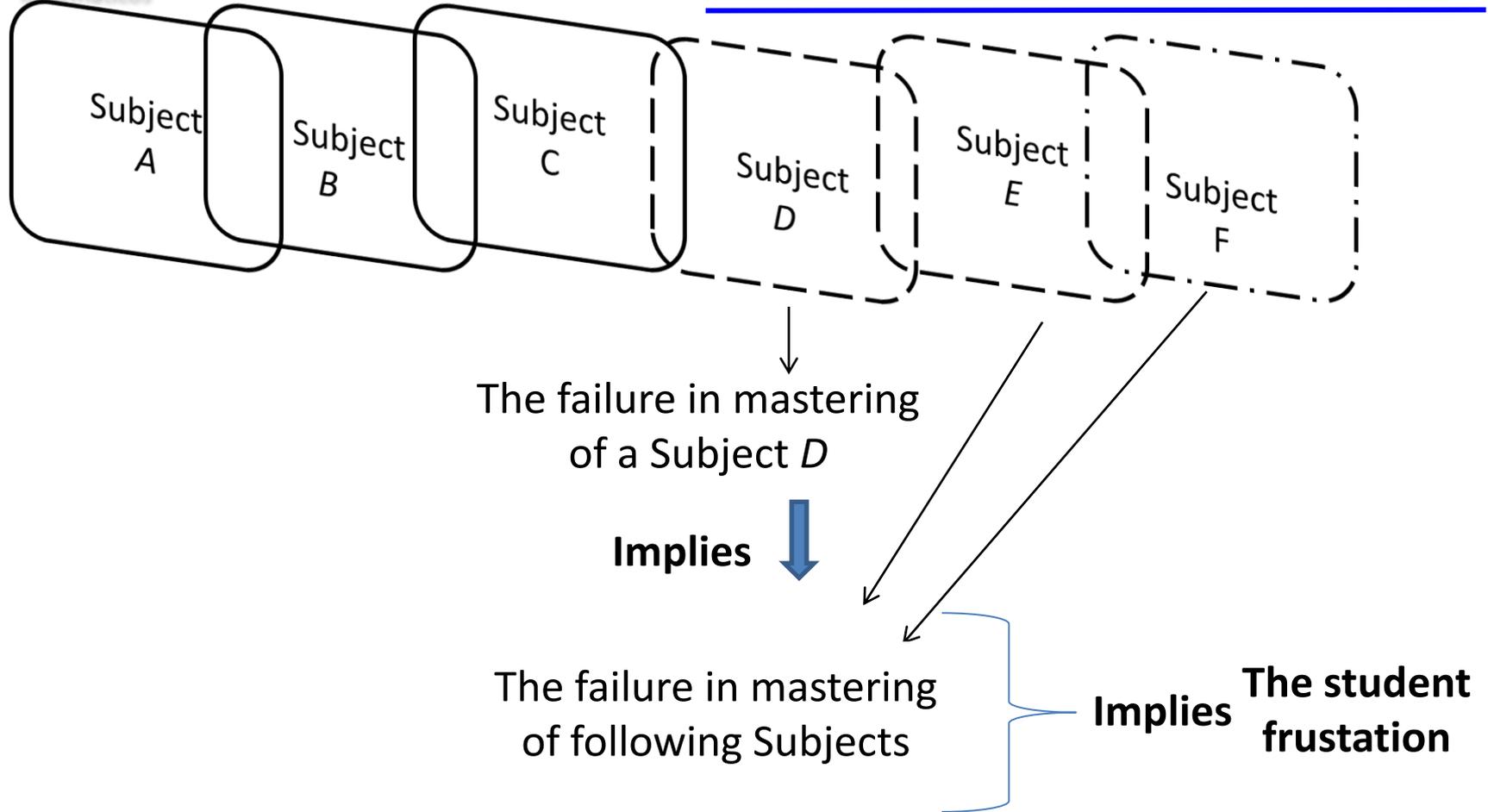
Most regulated studies imparted at universities are designed so that some basic subjects serve as a support for other, more complicated, subjects, *thus forming a complicated knowledge network.*

When a link in this chain fails, student frustration occurs as it prevents him from fully understanding the following educational links.

We consider subjects in lower level courses within both Bachelors and Masters degrees as *educational links* in which the student creates the foundation on which he would gain new knowledge, in other higher academic year.



Introduction



The failure of a link within the chain of knowledge of a certain subject matter provokes frustration in students.



Introduction

Introduction

- Motivation
- Objectives
- Our Proposal
- Conclusions
- Future Work

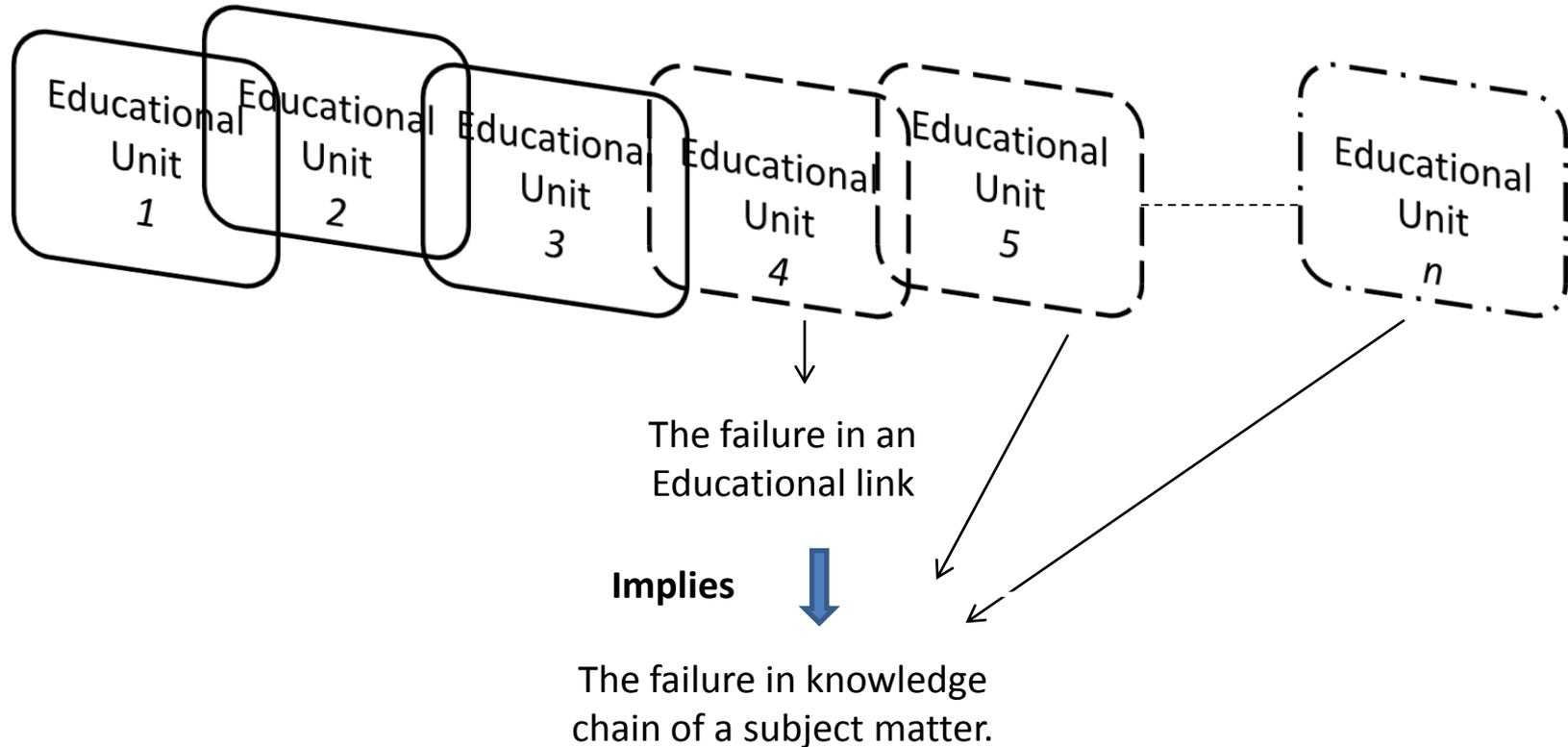
On a deeper level, we can consider a subject as a set of associated *educational units*, in which the knowledge of some units implies that other knowledge must previously known.

For example, Mathematical Science clearly shows this, as if we do not know how to add, we cannot learn how to multiply; and we cannot multiply unless we know how to divide.

We consider subjects in lower level courses within both Bachelors and Masters degrees as *educational links* in which the student creates the foundation on which he would gain new knowledge, in other higher academic year.



Introduction



- Not mastering an educational unit can provoke a failure within the chain of knowledge of a subject matter.***



Introduction



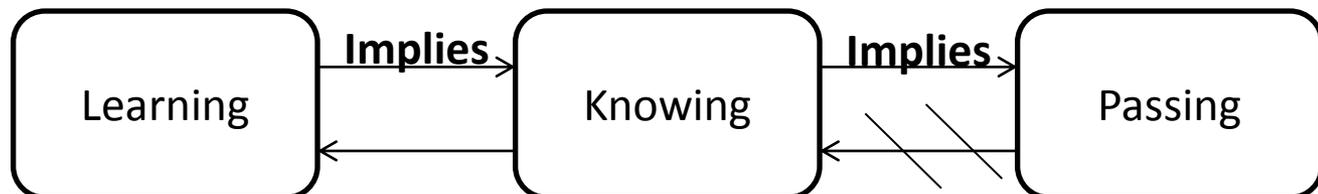
Introduction

- Motivation
- Objectives
- Our Proposal
- Conclusions
- Future Work

Therefore it is important that the student tackles his studies armed with the basic skills needed, as to avoid failure within his "*knowledge chain*".

We think that we must foster in students with the idea by which they should "*studying to learn*". This is an idea that is often confused with the notion of “**studying to pass**”.

Thus, *learning implies knowing*. *Knowing implies passing*, but not the other way around (Passing does not mean becoming knowledgeable).





The Educational Learning Lifecycle and the Cloud Computing



Contents

- Introduction
- Motivation
- Objectives
- Our Proposal
- Conclusions and Future Works



Motivation



- Introduction
- **Motivation**
- Objectives
- Our Proposal
- Conclusions
- Future Work

Traditionally, actors involved in the development process of the *knowledge chain* within a specific discipline, were: teachers, students and educational resources, which were used to strengthen teaching.

Where the teacher was the main actor, and the student, usually, was regarded as a mere spectator of his or her own training

In general, the student left all the responsibility for his own learning and results to the teacher, without taking the lead in their own training. Students rarely blamed themselves for their own failure

The famous phrase, "*The teacher is not good*" reflects this way of thinking, which we believe should be changed.



Motivation

- Introduction
- **Motivation**
- Objectives
- Our Proposal
- Conclusions
- Future Work

Today the new Information and Communication Technology ICT, provides other teaching and learning methods, replacing teachers and books.

Digital teaching materials make learning more enjoyable, intuitive and fast. Master classes are replaced by digital environments in which the professor does not appear.

Digital Books have replaced traditional text books printed in paper, which were heavier, complicated and difficult to understand.

Therefore, both teachers and educational resources are changing dramatically to adapt to the new times.

Yet, we ask ourselves about the students.



Motivation



What about the students?

How has he assimilated the changes regarding access to knowledge?

- Introduction
- **Motivation**
- Objectives
- Our Proposal
- Conclusions
- Future Work

We believe that now is a good time to change the way students learn. And that they stop being a mere spectator, and get involved and participate actively in the development of their own education.

But still, **well defined methods** to help us all make an efficient use of the new educational resources while maximizing the results, **are needed**.

This way we would be able to allow them to perform at their peak.



The Educational Learning Lifecycle and the Cloud Computing



Contents

- Introduction
- Motivation
- Objectives
- Our Proposal
- Conclusions and Future Works



Objectives

- Introduction
- Motivation
- **Objectives**
- Our Proposal
- Conclusions
- Future Work

In this paper we propose encouraging student pro-activity within their learning process.

We also propose that they become aware of their own knowledge as well as their deficiencies; so that they can improve one, and correct the other.

We want the students to adopt a dynamic of self-evaluation and self-criticism that would allow them to establish a continuous improvement in the educational process.

We propose a **student-centered methodology** to help them achieve their own goals, aside from using new ICTs such as Cloud Computing.



The Educational Learning Lifecycle and the Cloud Computing



Contents

- Introduction
- Motivation
- Objectives
- Our Proposal
- Conclusions and Future Works



Methodology



- Introduction
- Motivation
- Objectives
- Our Proposal**
- Conclusions
- Future Work

This methodology aims to increase the students' role, so that they cease being mere, passive, observers of their own education process and take an active role in it.

Also, we push the student to self-assess his efforts, and to analyze the causes affecting their performance "*once the causes are established it is easier to determine the solutions*".

We want them to react to their own failures and successes, while implementing corrective actions or determining their own improvement strategies, directing them to achieve progressively ambitious goals.



Methodology

- Introduction
- Motivation
- Objectives
- Our Proposal**
- Conclusions
- Future Work

We think that, given that *not all students are equal, not all of them need to correct the same actions* or adopt the same solutions; when faced with same problems.

Therefore, this proposal allows the student (both) *to tweak, adapt and personalize the methodology* and *to learn from the students' own mistakes* in a dynamic of continuous improvement in his *educational process*.

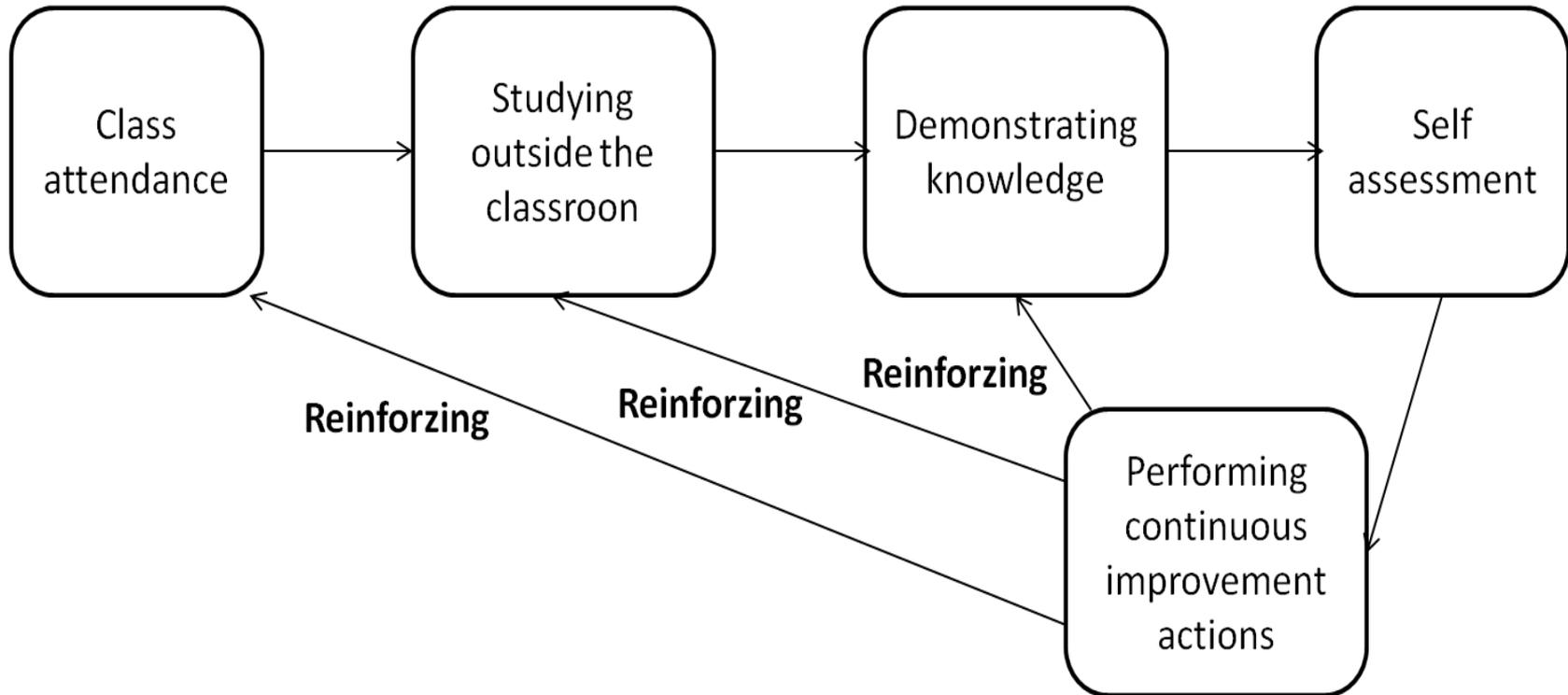
The methodology considers five phases, which are structured in what we call the "*Learning lifecycle*".



Methodology



Learning Lifecycle



Learning lifecycle that a student follows to master a given educational matter (educational unit).



Class attendance

- Introduction
- Motivation
- Objectives
- Our Proposal**
- Conclusions
- Future Work

In the classroom the teacher tries to make students understand the subject at hand.

The advantage of ICT in this phase is that the master lectures can be recorded on video, allowing students to replay again and again.

In this phase, the subject is introduced and the student listens, sometimes for the first time, concepts and definitions regarding the given discipline.



Studying outside the classroom

- Introduction
- Motivation
- Objectives

Our Proposal

- Conclusions
- Future Work

In this phase the student studies alone and sometimes in groups, as to try to consolidate the knowledge acquired in the previous phase.

ICTs offer, and increasingly more, a range of digital resources, that streamline student learning by making it much more colorful, fun, and friendly than traditional text books and notebooks.

It is in this phase in which the student comes to dominate/ learn the items studied.



Demonstrating knowledge

- Introduction
- Motivation
- Objectives
- Our Proposal**
- Conclusions
- Future Work

Once an item is known and mastered/learned the student should now prove what he has learned through the exams and exercises given out by the teacher.

ICTs have changed the assessment forms in accordance with the digital resources designed for the study of classes.

For example, multiple choice tests lower the percentage of students who leave questions unfinished due to feeling "insecure" or simply "going blank".

It is in this phase in which the student comes to dominate/ learn the items studied.



Self assessment

- Introduction
- Motivation
- Objectives
- Our Proposal**
- Conclusions
- Future Work

This phase consists of two parts:

- In the first part, the student becomes aware of his success or failure, self-evaluating the results of his or her own efforts, to learn the subject matter.
- In the second part he has to investigate into causes of his results, he learns to know himself. In any case his primary goal is to master the items studied and pass the course.

ICTs can also improve this phase by proposing forms listing the most common causes of failure in each phase.



Performing continuous improvement actions

- Introduction
- Motivation
- Objectives
- Our Proposal**
- Conclusions
- Future Work

In this phase the student must undertake *corrective actions*, which will then be applied within:

- The next learning cycle
- In the next educational unit
- Subject or course
- And so on ...



Proposal for Outsourcing of ICT Infrastructure by the Cloud



Performing continuous improvement actions

For example:

- Introduction
- Motivation
- Objectives
- Our Proposal**
- Conclusions
- Future Work

- If the self-evaluation of the previous phase is positive, the student may not consider taking any special action necessary:
 - The student may think he is doing well and he wants to remain the same.
 - He can also propose actions aimed at improving their outcomes within the next educational cycles.
- If a failure or poor performance is present in the self-evaluation, the student must propose corrective actions to strengthen its behavior in the previous phases, depending on the detected causes that lead to failure.



Methodology

Performing continuous improvement actions

If the student does not understand the contents of the subject matter studied (phase 1 failure):

- Introduction
- Motivation
- Objectives

Our Proposal

- Conclusions
- Future Work

- If he lacks the basic knowledge. He has lacks a class or an educational unit link. Recommendations:
 - He must study concepts he lacks in this area on his own.
 - He can talk to the teacher allowing him to guide him towards solving the problem.
- If he not attending classroom regularly. Recommendations:
 - Increase attendance.
- If he does not pay adequate attention to the teachers' imparted . Recommendations:
 - Increase attention and try to understand explanations and ask to clarify concepts, if necessary.



Methodology



The *Learning lifecycle* can also be applied to a subject.

- Introduction
- Motivation
- Objectives

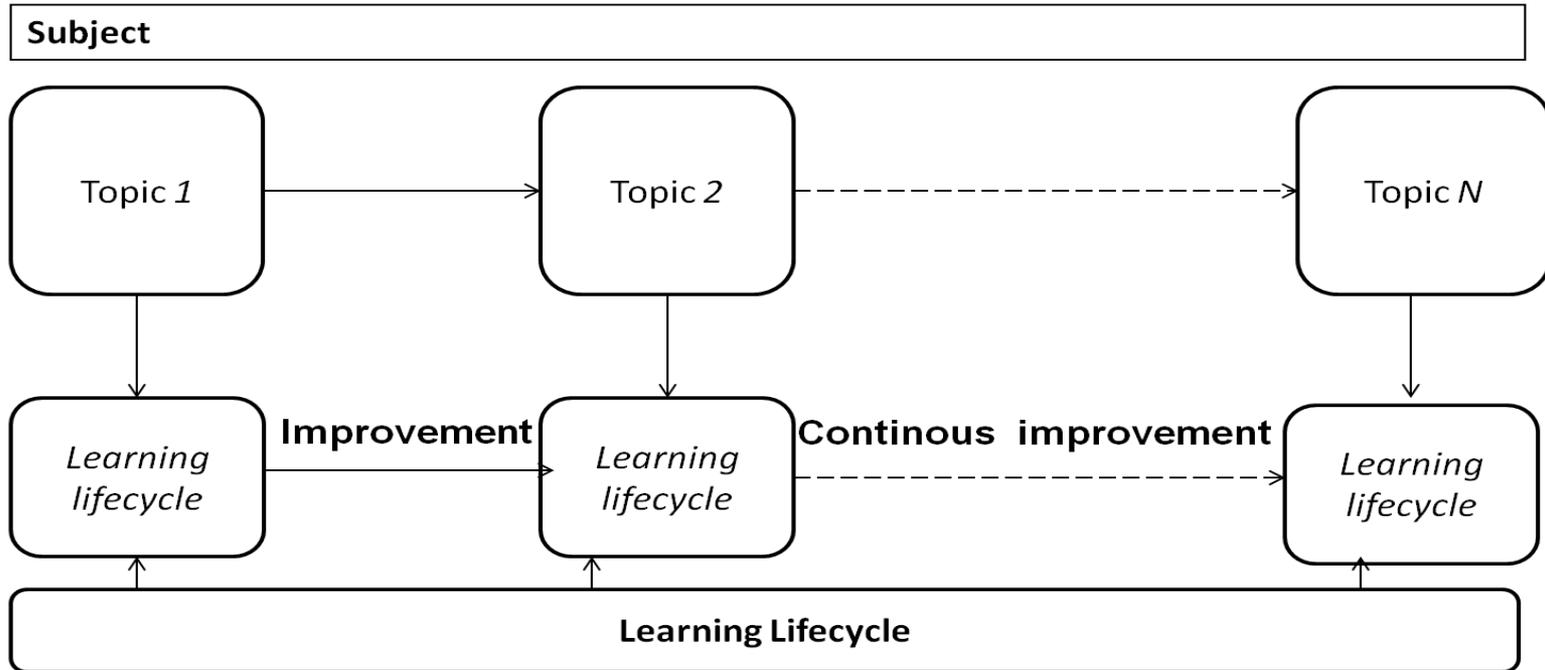
Our Proposal

- Conclusions
- Future Work

- The student learns from his own experience by analyzing the performance obtained after studying the first class topics,
- Proposing to improve the performance of the following issues
- While applying continuous improvement.



Methodology



We apply the Learning lifecycle to the topics of a subject. With this we can improve the performance of the following issues, in a continuous improvement.



The Educational Learning Lifecycle and the Cloud Computing



Contents

- Introduction
- Motivation
- Objectives
- Our Proposal
- Conclusions and Future Works



Conclusions and Future Works

Benefits

In summary with our methodology:



- Introduction
- Motivation
- Objectives
- Our Proposal
- **Conclusions**
- **Future Work**

- The student assesses himself. He faces his own performances metrics and judges them.
- He learns from his own mistakes.
- He develops a personal way of carrying out his own studying process.
- And he proposes actions which are specifically designed by him and for a continuous improvement dynamic within his *educational process*.

The student must take an active part in their academic background



Conclusions and Future Works



Our future research is directed:

- Introduction
- Motivation
- Objectives
- Our Proposal
- Conclusions**
- Future Work**

- Focusing on the implementation of our methodology on undergraduate students.
- Focusing in the development of better ICT educational tools for the Cloud
- Proposing sophisticated and complete forms that can assist the student in clearly identifying their mistakes when pursuing higher education studies
- Aside from forms that would assist them in adopting adequate corrective actions aimed at improving their academic performance
- And so on..



The Educational Learning Lifecycle and the Cloud Computing



Escuela Técnica Superior de Ingeniería de
Sistemas Informáticos

Ana Gonzalo Nuño
agonzalo@eui.upm.es

Concepción M. Gascuña
cmgascue@eui.upm.es