

Using Continuous Competency-Based Assessment as a Success Support Service in Higher Education

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Abstract—Succeeding higher education at staggered hours courses is difficult, especially for adults. They usually have a work during the day and sometimes a family to take care of aside work. Therefore, it makes it difficult for them to attend classes during weekday evenings or on Saturday. Generally, support success services are important to help students succeed in courses they are registered to. Unfortunately, there is not much extra time available to provide them with such an assistance in higher education at staggered hours. This work-in-progress paper shows how a continuous competency-based assessment approach has been used to support students all over the year.

This paper is about the use of a competency-based assessment (CBA) approach continuously all over the year as an implicit support success service. It shows how the feedback phases can be used as opportunities to support students and drive them towards success. The paper also discusses the consequences of the balance between giving strong deadlines and leaving autonomy to students for their assessments. More precisely, it presents the preliminary results of a study conducted on third year bachelor students in electronics and telecommunication.

To conclude, the analysis of quantitative and qualitative data collected from students who took part in the course lead to the conclusion that the CBA approach helped to support them all over the year. Upcoming work includes a more thorough analysis and a comparison between several cohorts.

Index Terms—Competency-based assessment, Success support service, Higher education

I. INTRODUCTION

Higher education at staggered hours is quite difficult to succeed, in particular for adults [1], [2]. Even if their motivation is usually high, they have to reconcile their studies with their personal life. They also generally have a daily work, which let them only a few free times to study or to prepare and work on assignments outside school hours.

Success support services (SSS) are usually found in universities to help freshman discover their new student life for their first study year [3], [4]. Such services are generally not found in small higher education institutions, at least in Belgium. However, such services are very important and relevant for the students from these institutions, even more in the case of online education [5]. In addition to help students succeeding their first year in a higher education institution, it also supports them to improve their non-technical skills, like time management or study method.

One issue with these support services is that they are usually provided outside courses, as remedial sessions [6], which does not attract many students. Another issue is that students

taking part in remedial sessions are typically good students who do not need it but participate to reassure themselves [7]. Integrating remedial and success support services directly into courses is usually more efficient [8], [9].

A. Motivation

Since there are not many resources in schools to dedicate for success support service activities and since students do not have much time outside school hours, providing these services as part of the teaching units is often the only possible and feasible solution to consider.

This work-in-progress paper pursues previous pieces of research on a continuous competency-based approach (CBA) [10]–[14] and explores how it can be deployed as an implicit success support service. Since the CBA approach proved to be suited for this particular public and contributed to motivate and accompany students towards success, using it as an implicit SSS would be relevant.

B. Research Question

The research question addressed in this paper is whether the CBA approach can be deployed to serve as a success support service or not. This work-in-progress paper examines the preliminary results of a first experiment conducted during the 2022–2023 academic year.

The remainder of this paper is organised as follows. Section II presents how the proposed success support service has been designed. Then Section III reports on the experiment that has been conducted. Section IV continues with a discussion on the results. Finally, the last section concludes the paper and draws up future work.

II. SUCCESS SUPPORT SERVICE

The continuous competency-based assessment (CBA) approach developed in previous research has been set up and deployed so as to serve at the same time a success support service (SSS). This section presents how the CBA approach has been used to provide support services in combination with the teaching and training activities.

A. Competency-Based Assessment Approach

The competency-based assessment approach used in this work has been developed by the author and presented in previous pieces of research [10]–[14]. The main idea is to

define the objective of courses with a list of basic and advanced competencies to master. The level of mastering is measured on a five-star scale. Students are then proposed a list of possible assessments to work on, each of them covering a subset of the course competencies. When students have selected and prepared several assessments, they present their work to the teacher. In case of a successful presentation, they can obtain between one and three competency stars for the covered competencies. In case of failure, they receive an immediate feedback and may get the opportunity to improve their work and present it again, depending on the kind of assessment. An online web platform has been developed to allow both students and teachers to keep track of the competencies mastery levels, in real time. Figure 1 shows the progress dashboard of one students for a course using the proposed CBA approach.

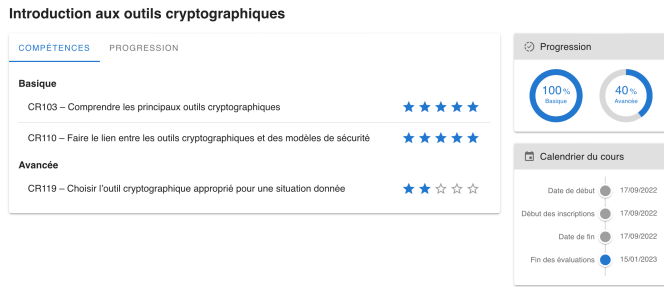


Fig. 1. Both students and teachers can keep track of their own progress in terms of acquired competency stars.

Moreover, the proposed CBA approach reverses the usual logic, asking students to prove that they improved their mastery level of selected competencies. Students are at the center of the learning system. This approach also offers a more individualised and personalised learning experience to them since they can choose the assessments they want to work on, favouring the ones corresponding to their own way of learning.

B. Work Rhythm

To be used as a success support service, the CBA approach is used in a continuous setting to foster regular involvement and hopefully lead to success [14]. Another advantage of a continuous approach is that it allows teachers to regularly check each student and have a precise picture of their progress and difficulties. As discussed in previous pieces of research about the proposed CBA approach, a too big level of autonomy for students is a weakness. Therefore, to be able to use it as a SSS, milestones have to be defined. The proposed ideas is to put mandatory milestones in terms of basic competency progress, during the semester.

C. Features

Several features are common to most success support services. Their goal is of course to drive students toward success, taking into account their individual situation and learning profiles. Support services that are provided should therefore be individualised and personalised. The most common features include remediation, coaching and counseling.

III. EXPERIMENT

This section presents how the proposed approach has been deployed during the 2022–2023 academic year for a digital transmission course, that has been transformed to the CBA approach recently [11]. The course is taught to third bachelor students and is organised as a course at staggered times, mainly targeted to adults who have a job. Supporting them towards success is very important for this particular public. These students are usually highly motivated, but combining studies with other day activities and their personal life is not easy.

A. Course organisation

The digital transmission course is a teaching unit consisting of two parts: an online theoretical part, with lectures, spread over the first semester and an on-site practical lab, with a project, during the second semester.

The theoretical part has been divided into three micro-courses [11], [13], each of them being defined with two basic and two advanced competencies. The practical lab is a group project accounting for five basic and five advanced competencies, some of the basic ones being shared with the theoretical micro-courses. This year, a total of eighteen students took the course.

B. Success Support Service

Several SSS features have been implemented for this experiment, some being intrinsic to the CBA approach and others independent from it.

In this experiment, milestones have been defined as a threshold of the number of basic competency stars to obtain at given points in time. Soft milestones have been defined during the semester for each micro-course and a hard one has been put and checked on January. This latter milestone provides the access to the practical lab. Students who did not manage to obtain 70% of all the micro-courses basic competencies (that is, 21 basic competency stars) directly fail the teaching unit and have to start it again next year. The second hard milestone is the end of the second semester, that is by June, where students must have validated all the basic competencies of the project, that cannot be redone if failed. A soft milestone has been set up at the same time for students to reach 100% of the basic competencies for the theoretical part. The last hard milestone for the teaching unit is in August, where students need to have acquired 100% of all the basic competencies to succeed the course. Table I summarises the proportion of basic competencies that must be acquired for students to succeed.

TABLE I
THREE HARD MILESTONES HAVE BEEN DEFINED WITH CONSTRAINTS ON THE PROPORTION OF BASIC COMPETENCIES THAT MUST BE ACQUIRED FOR A STUDENT TO SUCCEED THE COURSE IN AUGUST.

	Theoretical part	Practical part
January	[70%; 100%]	0%
June	[70%; 100%]	100%
August	100%	100%

About self-monitoring, students can look at their own progress on the web platform at any time. The teacher also regularly sent an email summarising the progress situation with advices on what to work on, at the end of each micro-course. These summary messages also contain personal softs deadlines to ensure a smooth progress. They offer a personal and individual coaching to students.

Finally, a last feature related to SSS is the regular formative assessments. In the proposed approach, short quizzes are proposed to students after each lecture. These true/false or multiple choices questions quizzes are both certificative and formative, in some way. On one side, students managing to answer correctly to the quizzes obtain a few competency stars as a reward. On the other side, failing them has no major impact since students can still succeed the course by working on other assessments. They just miss an opportunity to obtain a few competency stars with the quizzes. Students are made aware of this during the first lecture, the main goal being to play down mistakes, that may arise in their future professional life. Finally, the same principle can be used with other kinds of assessments, such as small projects with presentation. When presenting their work to the teacher, the latter usually provide direct counsellings, should the work be successful or not.

C. Collected data

To answer the research questions addressed in this paper, three sources of data have been considered. First of all, the progression rhythms of students, in terms of acquired basic competency stars, have been quickly analysed. Secondly, a short survey has been conducted among students to collect quantitative data on the perception about the CBA approach and the way it supported them towards success all over the year. This survey contains statements to evaluate on a 5-level Likert scale and a few open questions. Finally, informal feedbacks have been collected among students.

D. Results

On the 18 registered students, thirteen managed to obtain the required 70% basic competency stars directly at the first checkup on January and two of them were way too far to get them. These two latter students directly failed and will have to present the course again next year. The three remaining students were close to 70% and were given a second chance, a week later. They prepared a few assessments and succeeded upon their presentation to the teacher.

Looking at how students' progress rhythms evolved during the first semester, until the first hard milestone, three main profiles can be observed among the 18 students. Some of them progressed regularly all over the first semester and easily managed to obtain the 70% of basic competency stars. Others were not very active but succeeded to reach the mandatory threshold thanks to a hard and fruitful work at the first hard milestone. Finally, three students were the least participatory of the group, and they only acquired a few basic competencies during the semester, failing to reach the threshold at the first hard milestone. Hopefully, they were saved by the second

chance one week later but they clearly are the less good students. This fact was concretely observed during the practical part for which they had more difficulty than the other students.

The survey is still ongoing and only two students answered it at the time of writing this work-in-progress paper. Both students have succeeded the course, one being a good student and the other being an average one. Table II summarises the results that are rather positive and in favour of the approach.

TABLE II
TWO STUDENTS ANSWERED A SURVEY WITH STATEMENTS THAT WERE EVALUATED ON A 5-LEVEL LIKERT SCALE (1 BEING NOT AT ALL AND 5 BEING COMPLETELY).

I have the feeling that the split into micro-courses made it easier for me to gradually catch up on any delay	5
I have the feeling that the split into micro-courses made me more motivated to follow the course	3.5
I have the feeling that the split into micro-courses helped me succeed the course	4.5
I have the feeling that I better assimilated/understood the material	4
I have the feeling that I have been better supported in my learning	4.5
I regularly checked my progress on the web platform to know where I was	4
I have the feeling I had better control over my learning	5
I appreciated being able to progress at my own pace	4.5
I appreciated being able to choose the assessments to work on to prove the competencies I had to acquire for this course	4
I have the feeling that the CBA approach contributed to help me succeed in the course	4.5
The requirement to get a minimum of 70% of basic stars in January to access the practical part motivated me to work	4.5
The requirement to get a minimum of 70% of basic stars in January to access the practical part helped me succeed the course	4.5

Informal feedbacks from students tend to show that the proposed device supported them regularly and that they appreciated it. In bulk, they reported that *"we know where we are and therefore how to work accordingly."*, *"being able to steps to reach a minimum of 70% of basic competencies strongly motivates you to work to guarantee access to the essential modules"*, *"it's reassuring to be able to manage your time and your work, you can really adapt your schedule."*.

IV. DISCUSSION

The success rate of the 2022–2023 edition of the course is pretty high, with 16 students who succeeded the course out of the 18 registered ones. Their readiness and level of competency at the beginning of the practical lab were also felt better than previous years, by both teachers. The three students who succeeded after the second chance were indeed the weakest ones, and got special attention during the project.

The results obtained are quite encouraging, both in term of success as all the students who passed the first hard filter succeeded the course with good results. The proposed approach also supported students towards success, taking into account their own personal situation.

V. CONCLUSION AND FUTURE WORK

This paper explains how a competency-based assessment approach has been used to provide at the same time a success support system. Combining the benefits of the selected CBA

approach with specific milestones and activities, the pedagogical device proved to be a suited and relevant success support service for the targeted students.

Future work includes improving the platform supporting the CBA approach to include the different elements that have been added to implement the success support services. A more detailed evaluation will also be carried out on another edition of the course, next year.

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