Scrum as a Strategy for Learning Skills through Projects. Didactic Proposal for its Implementation in the Education technology curriculum

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Abstract – This study aims at conceptualizing how the Agile strategy, especially Scrum, may be used in education environments as a learning tool in universities, especially at education colleges, to make sure quality of education in line with the achievement, learning skills of the 21st century. First, the features of this methodology are described in process mapping with 12 steps so as to be easy to implement in the education environment and later connected to the literature of learning skills in the 21st century. This experience has shown that implementing the Scrum methodology may improve learning skills of the 21th century in terms of collaboration, self-regulation, and an increase in cognitive and metacognitive learning outcomes. Secondly, an empirical study was conducted. The Scrum methodology forces the teacher and students to clarify its purpose. As a result, its complexity is decreasing, and therefore the real-world issue is becoming less overwhelming. The reviews illustrate particularly the concepts that play a serious role. Thus, uncertainty about what to be told within the end-of-term tests pales. This, however, requires a redesign of context-based approaches. Developing an exciting real question isn't enough. It should be in the course of carefully developing tasks and appropriate reviews. Scrum celebrations and artifacts facilitate student collaboration and self-organization. Regular and explicit attention to those high-level skills may lead students to raise harden their future lives. The implementation of this technique may give new impetus to the promotion of context-based approaches. The study also suggests using the scrum methodology in an educational environment.It is necessary to own a guided oversight in well-designed professional development programs for the teacher to well-trained to use scrum a technique.

Keywords: agile methodologies, Scrum, Education technology, learning skills,

1. Introduction

The world is in rapid development and this development creates many challenges for the human being in various fields, especially education, Education, as the process of generating and preparing sustainable and responsible citizens for their integration into the labour market, where education adds to the individual's experiences in various areas including personal experiences and multiple experiences that work To prepare the individual to keep up with the developments of the labor market with his various technical or scientific skills in order to get a suitable job to play its role in raising the standard of living of the individual and achieving the economic and industrial growth of society.

There are some emerging methods of management, project and education as a project that needs a fundamental change in the traditional methods of education that depend on the old methods of designing education (planning, design, implementation, evaluation)so the course evaluation is last stages in learning sycle and that result of evaluation feeds into future course improvements . This evaluation does not benefit students much or deepens their educational experiences Clearly, if this evaluation can be integrated into the course at multiple points, students may actually see the benefits more immediately"((Glassey,R.;Wiggberg,)), so if we really want as faculty and administrators of educational programs to achieve the value of education for students to become well qualified for work and achieve sustainable development, we must have a new vision for teaching and learning process. In order to produce valuable changes during the teaching of a course, Agile Education implements a series of techniques that promote continuous and significant feedback among both faculty and students (. **Abigail**s, **Alberto..)**

This paper will discuss (how the scrum methodologies can improve learning outcome in light of 21th learning skills?

The importance of this study represent the worth of agile methodology, especially scrum approach in education technology, which could be a typical example of a context-based approach, as an efficient system within the educational process, in terms of promoting innovation, stimulating reason, thinking and opinion the learning skills for college kids, and it's a system that has guaranteed and safe communication between the scholar and therefore the teacher in the slightest degree times and everywhere, as long because the Internet is accessible to them.

1.3. Research Objectives objectives of the research are: (i) to obtain the adoption of a concise, substantial and innovative plan for development embracing scrum Education to make a basis for teaching the sensible side of education technology;to examine whether scrum has affected learning outcome; and (ii) (iii) to complement the education process by exploring the most effective methods wont to raise the standard of education in instruction institutions. (iii) Research could also be effective in put abase which will cause future studies.

1.4. Research Questions

The study problem stems from the requirement to line standards for tutorial performance within the education technology curriculum to make sure that the scholar gains the fundamental knowledge and skills so as to arrange them to a future teacher who are able to do the vision of Saudia Arabai for education in 2030 , In light of the theoretical foundations presented during this research, we aim to hold out the effect of the scrum approach within the education technology, in hypotheses of education scrum is an optimal _ RQ1: Is there any empirical evidence that the adoption of a concise, substantial and innovative plan for development embracing scrum Education to make a basis for significant learning of education technology? _ RQ2: Does this application; approve any changes in knowledge, skills, values and attitudes in female students of special education?
1.5. Research Scope and limitation The results of the study could also be limited by variables, objectives, and procedural definitions,Methods of assessment; additionally, the sample research consists of scholars at the school of education - Faculty of Science and humanities -Elrrass - University of Qassim the primary semester of the educational year,September 2019
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2- Theoretical framework

1. 1. Agile methodology

Agility is the ability to create and respond to change. It is a way of dealing with, and ultimately succeeding in, an uncertain and turbulent environment (agile alliance). It's really about thinking through how you can understand what's going on in the environment that you're in today, identify what uncertainty you're facing, and figure out how you can adapt to that as you go along.(Matt,Fish) There are various **methods** present in agile testing, and this paper we use scrum
2.2. Scrum

SCRUM is an agile development method which concentrates specifically on how to manage tasks within a team-based development environment. Basically, Scrum is derived from activity that occurs during a rugby match. Scrum believes in empowering the development team and advocates working in small teams (Seva Ganish,2019). It consists of three roles, and their responsibilities are explained as follows: Scrum Master is responsible for setting up the team, sprint meeting and removes obstacles to progress Product owner,The Product Owner creates product backlog, prioritizes the backlog and is responsible for the delivery of the functionality at each iteration Scrum Team Team manages its own work and organizes the work to complete the sprint or cycle.There are a number of researchers who have made a number of attempts to apply Agile Methodologies in education, especially Scrum by Willy Wijnands, a passionate chemistry and physics teacher of the Ashram College at Alphen aan de Rijn (Netherlands), and an Aikido teacher and called it eduScrum: A framework within which students can tackle complex adaptive problems, while productively and creatively achieving learning goals and personal growth of the highest possible value. EduScrum, like Scrum, is founded on empirical process control theory, or empiricism. Empiricism asserts that knowledge comes from experience and making decisions based on what is known. EduScrum employs an iterative, incremental approach to optimize the   achievability of learning goals and control risk (Delhij, A., van Solingen, R., & Wijnands2015,)
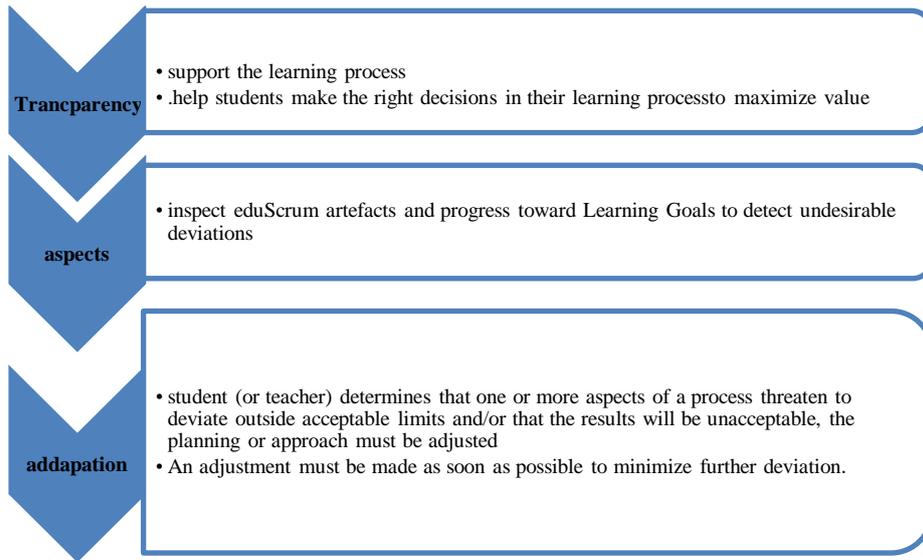
Trancparency
- support the learning process
- .help students make the right decisions in their learning processto maximize value

aspects
- inspect eduScrum artefacts and progress toward Learning Goals to detect undesirable deviations

addapation
- student (or teacher) determines that one or more aspects of a process threaten to deviate outside acceptable limits and/or that the results will be unacceptable, the planning or approach must be adjusted
- An adjustment must be made as soon as possible to minimize further deviation.

Fig. 1 show Three pillars uphold every implementation of empirical process control

Product Backlog Creation

Spri Planni

Working on the Sprint

Testing and Product Demonstration

Retrospective and Next Sprint Planning

Fig 2, Phases of Scrum Model

Trust and courage

transparency

Inspection &adaptive

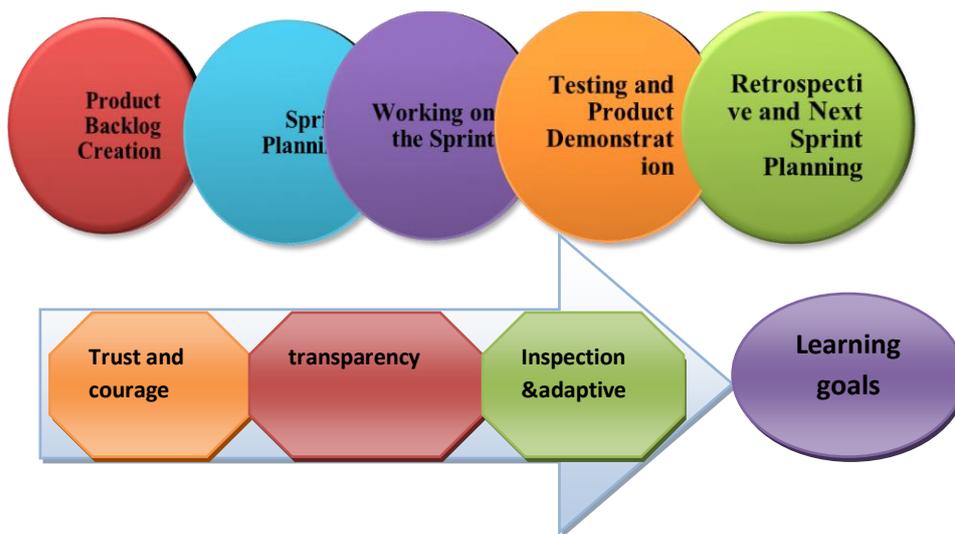Learning goals

Fig 3. the Student Team &learning goals. During the work

2.3 Education Technology (edtech)

Educational technology is the study and ethical practice of facilitating education and improving performance by creating, using and managing appropriate processes and technological resources (Richey, 2008). From this point we can define the main elements of education technology, which we suppose that could lead to education quality, which is representing the heartbeat of agile methodology.

Studies and research

The word of the study refers to the process of quantitative and qualitative research with the aim of collecting, analyzing and organizing information, to help in the judgment, philosophical analysis, historical survey, project development, error analysis, system analysis and evaluation with the aim of creating a knowledge base that is oriented to the applied side. For technology (Sarya,2013).
Ethical practice

 (Elgazar,1999) Suggests that education technology professionals and beneficiaries of education technology must maintain ethics, so the Association for Educational Communications and Technology formed the Ethics Committee (AECT), which introduced the Practice and Ethical, it has also been active in determining Ethical Standards AECT when using techniques and respecting intellectual property rights in the field of education technology.

The current definition of educational technology emphasizes that in the absence of ethical practice, success is incomplete

3. Facilitation

edtech led to a rethinking of the nature of the relationship between teaching and learning, the first official definition of AECT refers to the nature of the relationship in the design and use of messages governing learning processes, while the latter definitions focused on the direct relationship between Well-designed and delivered instructions and the effectiveness of learning, and the recent surge in learning theories have made learner roles focused on participation in knowledge-building, which has changed the role of technology to be more accessorized than control. Learning environments must therefore be stimulating, more accurate and realistic, as the key role of technology is not only to provide information, provide training and practice (to control learning), but to provide problem space and exploration tools (supporting learning).(A.elnour ,2019)

4- Learning

 Technology emphasizes that the goal of education today is not only to retain information or acquire knowledge, but to go further, and to move deeper, where interaction, sharing, collaboration and harmony. The greater the degree of interaction and harmony between the elements of the learning system, the greater the opportunities for learning. Today's learner is not an acquirer of knowledge, but a discoverer, creator and publisher, ensuring that the learner becomes more productive, more active and positive in educational situations. Therefore, attention should be paid to identifying learning tasks and how they are measured in the educational design process. (Attai, 2009)
-Improvement
In the case of education technology, the evaluation process is to improve performance by achieving efficiency that means the quality of products leads to effective learning that can actually be applied, and that link to efficiency, which means that we get results with the least time, less effort and less cost. In order to get effective, specific goals-Performance
The concept of performance refers to the ability of the learner to use and apply the abilities he has acquired, and education technology considers that improving performance means not only the development of knowledge but the ability to apply it. The education technology aims to increase productivity at the individual and institutional levels.

2.3.1. Instruction, learning phase:

Analysis PHASE: select the education content Step 1. Identify important situational factors such as Assess needs or define the educational problem, choose an appropriate computer program and its main technical feature Step 2. Identify important learning goals Step 3. Formulate appropriate feedback and assessment procedures Step 4. Select

effective teaching/learning activities Step 5. Make sure the primary analysis components are integrated. DESIGN PHASE: Assemble the Components into a Coherent Whole Step 1. Create a thematic structure for the education unit (story board) Step 2. Select or create an instructional strategy Step 3. Integrate the unit structure and the instructional strategy to create an overall scheme of learning activities. Development PHASE: Finish Important Remaining Tasks Step 1. Develop the grading system (evaluation) Step 10. Productivity

2.4. The term 21st century skills

The term 21st century skills according to the Partnership for 21st century skills has referred to: "The skill set for success and action in the twenty-first century such as learning and innovation skills, informational and technological culture, life and work skills".Benkley and his colleagues ([Binkley et al., 2011](#)) define 21st century skills as "ways to think, work, and live in connected worlds, rich in media." In response to the demands of the twenty-first century, the Partnership for 21st century skills has sought to identify the skills of the twenty-first century to include:· Learning and innovation skills that consist of: Creativity and innovation skills, critical thinking skills, problem solving, communication skills and collaboration.· Information skills, media, and technology consist of: Information culture, media culture, and technological culture.· Life and professional skills consist of: Flexibility, adaptation, initiative and self-direction, social skills, productivity and accounting, leadership and accountability.
2.7. Saudi Arabia's vision in education is targeted by Vision 2030...

The message of Saudi vision for future education and up to 2030 included many of the goals that the Kingdom seeks to achieve during this period. And they are:

Education for all in an appropriate educational environment in the light of the Kingdom's educational policy.

- Raising the quality of education outputs.

– Increase the effectiveness of scientific research.

- Encouraging creativity and innovation.

-Development of community partnership

- Upgrading the capacities and skills of education coordinators.

– It also closed the gap between higher education output and labour market requirements.

Development of public education and orientation of students toward appropriate career and career options.

To provide the opportunity to rehabilitate students and to move between different educational courses. Positive signs of improved methods of learning achievement... visibility has been shown to exist Positive signs for improving methods of learning achievement, developing advanced scientific and educational curricula in line with global developments, as well as increasing training and training programs for higher education supervisors([Mustafa, 2019](#))

2- Literature review

- ([D. Damian, C. Lassenius, M. Paasivaara, A. Borici and A. Schröter 2012](#)) stated that "This paper describes the goals, design and initial challenges encountered in teaching a globally distributed software development course in collaboration between the University of Victoria, Canada and Aalto University, Finland. The project-driven collaboration course involved 16 students in Canada and nine students in Finland, divided into three globally distributed Scrum teams working on the same project. The teams worked on extending Agilefant, an open-source backlog management system, in direct interaction with its product owner. The collaborative development is based on the Scrum methodology. We describe how the Scrum methodology was implemented, and adapted to work in a distributed environment, as well as the infrastructure used to support collaboration, e.g. local war-rooms, and multiple communication tools. We conclude the paper by describing initial challenges encountered, including cultural, semester, course and curriculum differences, as well as technical and time-zone issues."

- (. [S. Fernanda Manuel, R. Germania, C. Samanta, J. Danilo and A. Patricio2018](#)) stated that: To espouse the principles, values and agile practices in the academic scope, it is proposed to use the Scrum methodology as a

reference model for teamwork, where the results are obtained incrementally, and established short periods of works referenced by a pattern. The prioritized requirements list is given by the applicant (teacher), who at the beginning of the academic period (6 months) together with the team (students and teachers) decides the possible points on the list to make in that lapse of time. The same team determines the tasks necessary your assignment. Once the academic period is over, the results are presented and who requested them will validate the compliance with the requirements. Then, the team reflects together about the work done highlighting positive and negative aspects, improvement proposal and if necessary make a new interaction. This is repeated until the result meets the expectations of the applicant, who is in constant communication with the team being able to introduce changes in both the requirements and the priority of these.

-(D. A.Dewi and M.Muniandy 2018) study reveals that, review of literatures that shows the contribution of the agile methodology towards teaching and learning environment at university level. Teaching and learning at university has since migrated from traditional learning to active learning methodology where students are expected to learn by doing rather than listening passively to lectures alone. The agile methodology naturally has promoted the active participation of team members during system development phases. The nature of agile development methodology has been identified as abundantly compatible and supportive towards active academic learning. Some literature has proposed ways of adopting agile into active learning to improve teaching and learning processes and have highlighted this method as a great success. With the review presented in this paper, we would like to highlight how efficient the agile concept is in tackling several situations in academic learning as shown by an interesting mapping of agile principles to the classroom environment. With that, we hope to bring more options to improve active teaching and learning delivery by adopting agile methodologies. On the other hand, few papers have used the academic environment to measure the agile principles. By highlighting this, we offer options for the agile evaluation framework to consider the academic environment as a tool to obtain the agile performance feedback.

P. Kastl and R. Romeike2018) Teaching programming novices in secondary education is often described as a challenge, because student groups are often quite heterogeneous. Teachers react with special methods, e.g. with individualized teaching, group work or project-based learning. As such, a method for computer science education that supports project-based learning agile projects have been discussed more recently. In the context of a design-based research work, experienced teachers have adapted and applied a theory-derived agile model in a wide range of contexts. In this qualitative case-study, we analyse 11 interviews with 6 teachers on their observations from 20 agile projects with over 400 students. The aim is to gain insight into how agile practices assist individual learning processes and how they help teachers to design and organize projects in order to support students individually. A structured content analysis shows that agile teams face similar obstacles as teams in plan driven projects, but that they can overcome them better in agile projects. Additionally, the analysis indicates that in agile projects the quantity and quality of interactions increases, which has positive effects on the construction of sustainable skills and that students furthermore are frequently involved in feedback processes and reflections, which makes their learning more goal-oriented. Moreover, the data show that teachers can identify their students' strengths and weaknesses better and also observe their individual learning processes better throughout agile project. Based on that knowledge they can design their agile project in a way that each student is challenged systematically and purposefully.

-(A. Battou, O. Baz and D. Mammass, 2017) This paper presents a case of study of a virtual learning environment based on Agile Learning Design approach and integrating learner-centred design. It aims to give the foundation of a framework that gives extensive attention at each stage of the design process to the end user - which is in our case the learners-to improve teaching effectiveness, facilitate learning among learners, encourage long life learning and maximize motivation as well as reducing the dropout rates.

3- Methodology

Educational Technology (eduTec) is a typical example of a context-based approach.It consists of five modules complemented by a challenging, final assignment. The curriculum is based on a recognizable context, starting from the defining standard of education technology as It encompasses several domains, including learning theory, computer-based training, online learning, and where mobile technologies are used, m-learning. Accordingly, there are several discrete aspects of describing the intellectual and technical development of educational technology (Richey,2008) Given the fact that smart phones and tablets play an important role in students' lives, this context attributes to students' individual interest, which plays an important role in their motivation to study main concepts of education technology In addition, the context helps students to see the value of accompanying learning activities. In the second stage, students are challenged to work on and understand the underlying instructional design concept

as a framework of learning theories, according to the 'need-to-know' principle. In the third stage they will get insight in environmental issues connected to the use of instructional design to solve learning problems by using digital learning resources. Finally, students are invited to design and build their own program, for instance in the form of didactic aid projects.At the start of the academic semester in august 2019 the teacher, in his role as a product owner, explained the learning objectives to students According to the official description of the educational technology in the Department of Special Education- Faculty of Science and arts - Alrras -University of Qassim.And presented the multi tasks of the project. In scrum terms, the teacher took his role as a product owner and presented the project's ultimate goal to the students (Figure 4, step 1). In this particular case, students should design and complete the project of" Designing and building a product, computer program, app to address a specific need, such as assisting the disabled" contains 5 tasks and divided the projects into smaller tasks and set 2-3 weeks to finish every task to go through five steps represent the skills of instructional design, analysis, development, implement and evaluate .(Figure 4.step2). The students of special education were divided into 8 groups; each group containing 5 female students every group voted to choose one student to become team master During the project, the scrum masters played a crucial role. Typical responsibilities are: initiating dialogue among team members about the project issues, facilitating cross-team collaboration and communicating with the product owner (Figure 4.step 3)   the product owner provided each scrum team with a product backlog in which apps, experiments and deadlines were presented. The product backlog of project of design, multi education aids cover a period of approximately 12 weeks.

Every week, students participated in theory lessons in 60 and practiced one 0f 120 minutes. (Figure 4, step 4) The newly formed teams gathered to make their first arrangements. Firstly, they invented a group name, and agreed on their own definition of fun, and their own definition of done. Making up their own group name and definitions of fun and done contributed to feelings of ownership and autonomy. In the definition of fun, they describe how they want to collaborate in a pleasant way to enjoy the project (Figure 4. Step 5). A typical example of a definition of fun is: is make a group using social media tools to share their own feelings and jokes. An example of a definition of doing is: we will complete every small task according to acceptance criteria. Scrum teams became aware of how many points they had to 'burn down' in two weeks. (Figure 4. Step 6 the design process and assignments were made visible on a scrum board, which – in its most simple form - comprises four columns: 1) product backlog with all items; 2) to do; 3) doing; and 4) done. An overview of all activities and their progress could be seen on the scrum board by both the scrum team members and the teacher Figure 4, step 8).

The next phase included valuing task according to rubric sheet which, provided to each team before starting task in the project process with points" rubric sheet" and consisted of approximately 10 points.. Every task or An intermediate product was always related to the final product, and its quality was checked in the review phase of the group and the product owner. To present their work, students make a final check of their products work and complete the self-assessment column. During this self-assessment step, students often find ways to improve their work. Peer assessment can also be performed at this time. Assessment experiences often improve students' self-assessment skills. The final step is for the teacher to evaluate the work, and at the same time, assess the student's self-assessment. When differences are detected between student self-assessment and teacher evaluation of student work, the teacher may decide to give extra time with students who need to work to improve the accuracy of self-assessment. (Figure 4, step 9). Scrum teams discussed the difficulty of an assignment. All points for the assignments of the upcoming two weeks were added together. The two-week period formed a sprint every two weeks each scrum team released an intermediate product, the sprint-release (Completed didactic aids). (Figure 4, step`11)
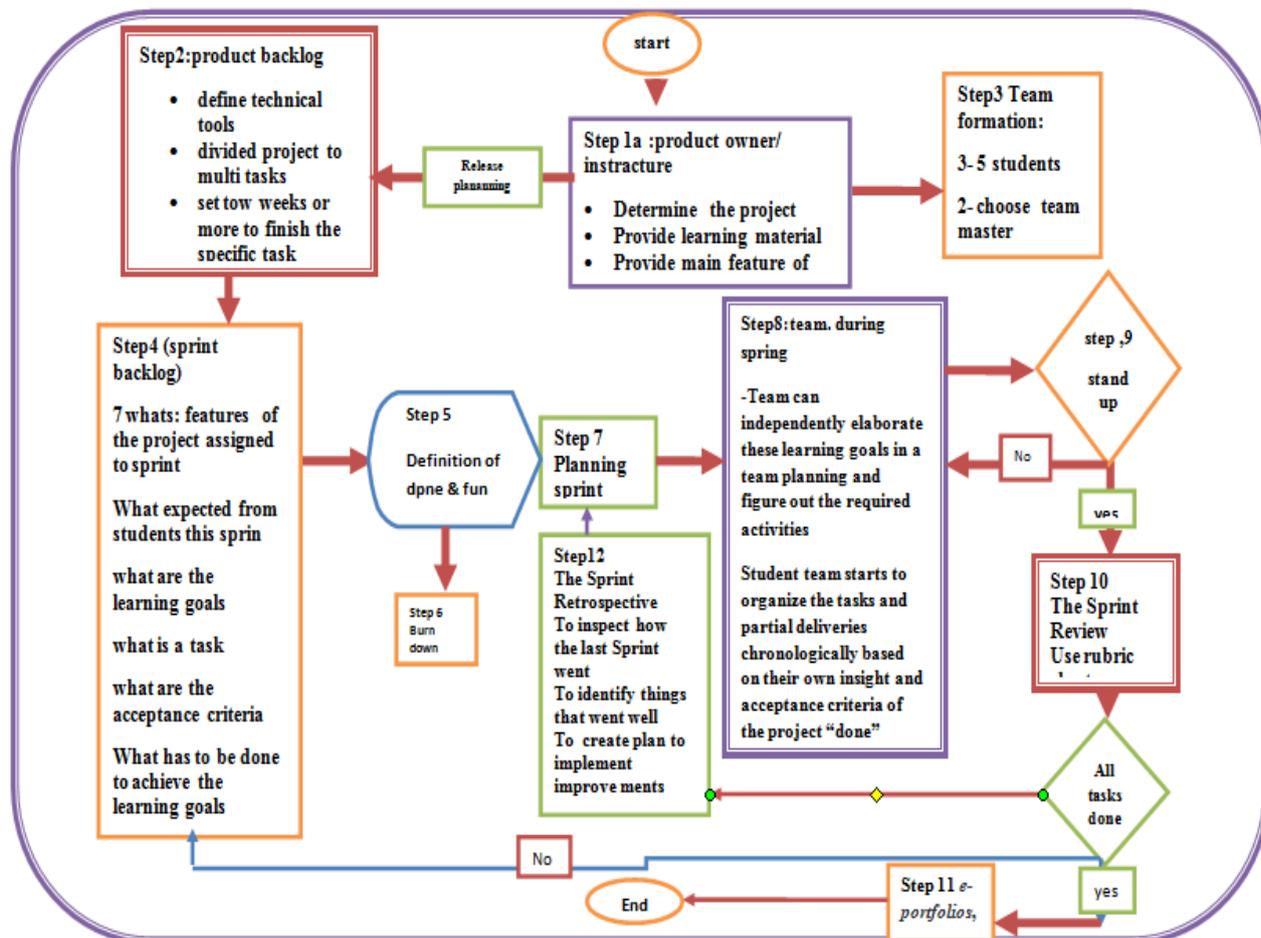
Fig. 4 .**Applying process mapping in Didactic Aids Project** [1]

(Students became aware of the requirements they have to meet; their skills and qualities were taken seriously and their autonomy and self-regulation were encouraged by giving them the opportunity to plan their own work. Team forming and planning of all assignments were followed by several sprints A typical sprint took two weeks, with in total 2-3 lessons of 120 minutes each. Every lesson in a sprint started with a ceremony, called 'stand-up', in which teams discussed three questions: 1) What have you done? 2) Do you experience problems? And 3) what to do next Every student contributed to this short standup meeting (Figure 4, step 9).

Answering these questions aimed to evoke an appropriate response to the challenges of the project and moved students in the right direction making the project less overwhelming. A typical standup ceremony took 5 minutes at most and was followed by working on assignments, design, and exercises.. Teammates regularly discussed the progress. According to their sprint plan (Figure 4step 7) they burned 'points'.. Reviewing the quality in this educational context meant that the focus was on the education technology terms (analyse, design, developments. Implement, evaluation) that were involved in the project. Did the students understand the education technology concepts that were used to accomplish the assignments of the sprint? Were there any misconceptions present? A typical example of a review was a formative assessment provided by the teacher (Figure 4, step9).

Students answered questions individually about the education technology concepts relevant to the project. They discussed their answers in their team or with the teacher. Both students and teacher got insight in the learning progress during the project. Students became aware of conceptual problems they had and could ask relevant questions to team members or teacher. In addition, teachers, if necessary, intensify coaching of a particular scrum

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[1] Sprints consist of: • Sprint Planning meeting including Team Formation • Stand Ups at the start of every class
• performing assignments and tasks within a Sprint • Sprint Review
• Sprint Retrospective and Personal Reflectionhttp://eduscrum.nl/en/file/CKFiles/The_eduScrum_Guide_EN_1.2.pdf

team Before starting a new sprint cycle, scrum teams were invited to reflect on their collaboration and whether their efforts were in line with their own definition of done (Figure 4, step 12).

This phase, called retrospective, was intended to improve the collaboration. Every scrum team was asked to formulate just one point of improvement to work on in the next sprint. Both the review and retrospective phase triggered students' reflections. A review focused on students' conceptual development, whereas the retrospective concentrated on the procedural aspects of the Scrum methodology, such as collaboration among team members. The project of design didactic aids, or programs consisted of five successive sprints of approximately two weeks each in which students improved their product and showed substantial growth in their conceptual development. Finally, the scrum teams presented their final products, to each other and the product owner depending on college policy, the project was completed with an additional, summative assessment a test was designed for female students with a total grade of 50 consisting of 50 multiple choice questions. In order to calculate the overall grade of the subject, the mark of the test were added to the grades of Rubric Sheet for each student team. See students' results in table 1

Table1. Student's grades after implementing scrum

No of students	Marks	Grade	Percentage Marks	Remarks
3	95 -96	A+	95 and above	Excellent plus
9	90-95	A	90-95	Excellent
12	89-85	B+	89-85	Very good upper
8	84-80	B	84-80	Very good
8	79-75	C+	79-75	Good upper
	74-70	C	74-70	Good
	69-65	D+	69-65	Moderate
	64-60	D	64-60	Fair
	<60		59 and below	Failed

Scrum as *a* strategy to gain learning skills in 21th century

learning skills in 21th century represented in three dimensions :learning skills, Creativity and innovation skills, critical thinking skills, problem solving, communication skills and collaboration.· Information skills, media, and technology consist of: Information culture, media culture, and technological culture.· Life and professional skills consist of: Flexibility, adaptation, initiative and self-direction, social skills, productivity and accounting, leadership and accountability.We need a whole, interconnected system of course content review, using authentic assessment methods such as portfolios, projects, cumulative reports, activating teaching methods based on solving problems, projects and questions in various forms, providing an appropriate environment conducive to creativity and innovation from modern technical infrastructures, flexible classrooms, professional development of teachers and community participation Local, all of this is to better prepare students to become self-directed, creative, and producers in twenty-first-century society.When viewing the roles, ceremony, and products of the Scrum methodology from a theoretical perspective, provide insight into their potential to achieve twenty-first century learning skills in context-based learning environments. The Scrum methodology has influenced the learning process in many ways, such as building knowledge by the learner It makes it meaningful in many aspects of student life , a spirit of collaboration, innovation, and self regulation   The education and learning process in universities is faced with a large number of female students, and there is one teacher for training students and following up on their performance and discipline during the study of the education technology course, the need for a new methodology that proved effective in the education process was demonstrated by reviewing many previous research and studies such as the Scrum in education which proved successful in education outcome and control learning environments Therefore. It is crucial to develop additional support to develop students' learning and their development, to direct their learning, to keep them on track and to control the learning process. Tools, Learning Environment can be helpful and independent instruments. We define learning skills in 21th century provided to students who have been re-education by the teacher or by tools, the learning process is screened by empowering, supportive academic and life skills, ability to adapt, compete, and meet challenges. The framework was based on the promotion of skills:

Critical thinking, communication, and collective action, creativity and problem solving, leadership and decision-making, local and global citizenship, leadership and initiative, technological culture, and linguistic potential. Procedures and experiences to guide and improve students' learning process, Stimulate self-reeducation and autonomy, to guide them to achieve their learning objective and contribute to their engagement.

4. Results& discussions

To answer the first question of the research (Is there any empirical evidence that the adoption of *a concise,* substantial and innovative *plan* for development embracing scrum enhance learning skills of 21th century? We use Context-based approaches, Scrum methodology to design process mapping Figure 4 (contains12 steps implemented in education environment) and their connection with learning skills in 21th century And in this study we try to add some skills which are stemmed from learning skills in the 21th century and observed when, students learn educational technology course by means of implemented Scrum methodology in educational environment.

 Design (D) — the first key component in designing effective professional development, as outlined by the Center for Implementing Technology in Education (*CITEd*), is that it must be *planned and intentional.* (CITEd Research Center). Students' interest is enhanced by a definition at the beginning of the context-based course at the Education Technology Corus. The teacher connects context to students' personal life by emphasizing that smartphones have the high technological capability and many applications that students can use to design programs that address community-specific problems. The benefit indicates that new skills are acquired from completing the task. The importance of making good connections to the expected gains from ending the learning task and efforts suggests how engaging in the task causes frustration or distracts the student from other, more pleasant activities. Cole, Bergen, and Whitaker (2008) have shown that high task value is useful for learning and contributes positively to students' efforts to achieve good performance. So this means pre teacher, students must have the capacity to discover with one's surroundings as a form of problem-solving so through this study, which used scrum as a strategy to gain 21th learning skills ,students should design and complete the project of'' Design and create a product, computer software, and application. To meet a specific need, such as helping students learn effectively''

Communicating and Collaborating (Cc)— Concerns how well students are able to use technologies to communicate in a variety of ways, working individually or in teams, with peers and experts. Figure 4 step2) The ability to travel across diverse communities, discerning and respecting multiple perspectives, and grasping and following alternative norms outcome, such as systems thinking, anticipatory, normative, strategic, collaborative, critical thinking, and self-awareness competencies (Rieckmann, 2018) J, the Scrum methodology requires groups to formulate common goals. Each group is invited to formulate its own definition of what has been done and define the fun. As they identify students that have been completed, their shared commitment appears. A typical example of a student-created definition is "We finished our work when all team members understand the concepts of learning technology involved." This definition clearly shows their commitment. Definition of Fun: Each team belongs to a group in social media where we exchange some jokes. Such simple but self-appointed, shared goals can contribute to a positive climate in which fellow groups feel interdependent. Research has shown that students with positive connections are doing more and engaging in higher-quality interaction with group members of students who are not interlinked (Johnson & Johnson, 2008).

In addition, the formulation of common goals can be invoked by social objectives such as a sense of personal responsibility and commitment where both social and shared goals exist, have been performing higher job than self-evaluations of group performance than groups that have sought only to achieve common goals.

Achieving Goals (A.G)

Refer to students' systematic use of technological knowledge, tools, and skills to solve problems and achieve goals presented in realistic The Scrum methodology provides the protocol and tools needed to support this collaboration. Team formation is based on students' personal qualities, making each student valuable and responsible for achieving the ultimate goal. Working with a fast and frequent sprints makes the big learning task more manageable, contributing to short-term goals. At the end of each Sprint module cycle, review and feedback is provided on both conceptual development strategies and procedural strategies, respectively. Students and the teacher can modify their approach and explanations. The order of rational goals is motivated with team colleagues during backup meetings, evaluate task points, and agree on how many points should be burned during the lesson.

Simulation —(S) The ability of a student to create an artificial reality in the learning environment and learning process through exploration, which contributes to engaging students with experience and enriching the learning process with modern technological expertise and capabilities to produce multimedia programs to teach students with specefic needs , when we use scrum to construct the project we notice student gain the ability to interpret and construct dynamic models of real-world as the component of multi media program which represent intermediate product of the project (Figure 4 step 2&10)

Self-control (SF)

Working in a team spirit and discipline with a sense of responsibility, all that was observed during the implementation of the project in the academic setting, is related self-discipline, self-regulation, delay of gratification and impulse control.

Performance Task Assessment Lists (PTA)(K. Michael Hibbard, Linda Van Wagenen, Samuel Lewbel..1995) stated that, Performance task assessment lists are assessment tools that provide the structure students need to work more independently and to encourage them to pay attention to the quality of their work. Assessment lists also enable the teacher to efficiently provide students with information on the strengths and weaknesses of their work. In creating performance task assessment lists, teachers focus on what students need to know and be able to do. One result is that teachers can more consistently and fairly evaluate and grade student work. Information from performance task assessment lists also helps students set learning goals and thus helps teachers focus subsequent instruction..Both control and reassessment can be promoted through retrospective screening. As part of the oral review, students are encouraged to analyse what could have been done differently through the Sprint module. The short checklist, which includes questions about mutual cooperation during the sprint and a focus on the quality of information exchange among team members, can serve as a living reminder of their own Done definition. Students may find that failure is due to factors under their control. The retrospective exam therefore provides information that students can use to improve the learning process in the next sprint cycle. Teachers also play a crucial role in promoting emotional regulation by providing alternative explanations for feelings of confusion and frustration, especially when students judge failure as self-reflection or low ability

Appropriation (A) — Appropriation is a form of internalization, because it is not just a matter of a person knowing how to use the technology at ease, but rather to take ownership of something that hadn't previously belonged to that person (Rogoff, 1995). It is also a process that takes place on different social levels, from the level of the individual user through the larger sociocultural environment (Overdijk and van Diggelen, 2006). While appropriating a technology, participants become more and more proficient in the use of a set of tools in the context of a social practice(Almgren, Magnus & Jonsson, E., 2004). In (Figure 4 step10) students have the ability to choose from various educational resources to achieve a meaningful goal and re-mix media content

Collective Intelligence (Ci) — the ability to pool knowledge and compare notes with Others toward a common goal .Through implementing scrum we notice **The tasks** provided in the product build-up must be compatible with students' abilities. Although students may be interested in smartphones that affect their personal lives, they will not engage in this process if they do not have an expected average success in addition to a clear introduction to the context-based approach; it is crucial that a serious discussion be held between the teacher and students about the requirements of the final learning task. If students realize that they can accomplish all tasks and achieve the ultimate goal of the course, they will face the concept of optimal challenge.. Therefore, teacher feedback at the review stage or during the backward review at the end of the sprint should include comments to attribute students' success to their hard work and use of effective strategy, and if appropriate, lack of success leads to insufficient effort and misuse of strategy. The review and retrospective phase is a natural moment for the submission of these comments. These Scrum Protocols could facilitate the promotion of the expected average success. From a student's perspective, the review and backward phase can contribute to identifying effective strategies for achieving learning goals, respectively, in both conceptual development and procedural aspects of learning

Self-efficacy

The concept of self- efficacy is a concept of modern psychology in which self-conscious competence emphasizes an individual's belief in his or her ability to exercise control over events that affect his or her life. Self-conscious self-competence depends in part on self-awareness, an image that the individual develops from himself, and affects the level of effort in the performance of tasks. (Gruan,2005).This balance can be provided by the Scrum methodology. This tool includes procedures for scheduling project segments in Sprinints and encourages students to reflect on the quality of their work. At the same time, groups are free to choose their own strategies. Additional benefits are short periods of time of the Sprint cycle.

Table.2.Relationship between Scrum methodology and 21th learning skills through current study and Literature review

The Scrum Methodology steps implemented through learning context .	Learning skills strategay and the relation ship between literature review and study	Significant learning skills Factors involved
Product owner Figure 4step 1	**Establish clear group goals** **Use real-world problems** the Scrum methodology as a reference model for teamwork, where the results are obtained incrementally, established short periods of works referenced by a pattern. The prioritized requirements list are given by applicant (teacher), who at the beginning of the academic period	D
Team formation Figure 4step 3	Interacting in Heterogeneous Groups multiple communication tools(D. Damian, C. Lassenius, M. Paasivaara, A. Borici and A. Schröter 2012) **Keep groups mid sized** **,Establish flexible group normsby**	CC **SF)**
Work planning Figure 4 step 2	Information skills, media, and technology consist of: Information culture, media culture, and technological culture Using Tools Interactively which has positive effects on the construction of sustainable skills and that students furthermore are frequently involved in feedback processes and reflections, which makes their learning more goal-oriented(P. Kastl and R. Romeike2018	CC, S
Students team during springFigure 4 step 7	The ability to relate well to others Flexibility, adaptation, initiative and self-direction, social skills The nature of agile development methodology has been identified as abundantly compatible and supportive towards active academic learning(D. A.Dewi and M.Muniandy 2018)	CC CI. **SF)**
Students team during springFigure 4 step 6	: " abilities to tackle complex mental tasks, going well beyond the basic reproduction Creativity and innovation the agile concept is in tackling several situations in academic learning as shown by an interesting mapping of agile principles to the classroom environment The aim is to gain insight into how agile practices assist individual learning processes and how they help teachers to design and organize projects in order to support students individually.(D. A.Dewi and M.Muniandy 2018)	A,cc,ci

Spring review Figure 4 step 10	The ability to assess their works provide the structure students need to work more independently and to encourage them to pay attention to the quality of their work. Assessment lists also enable the teacher to efficiently provide students with information on the strengths and weaknesses of their work. S. Fernanda Manuel, R. Germania, C. Samanta, J. Danilo and A. Patricio2018)	**PAT,CC. SF)**
retrospective , Figure 4 step 12	initiative and self-direction Self-conscious self-competence depends in part on self-awareness, an image that the individual develops from himself, and affects the level of effort in the performance of tasks. Prioritise and refine goals; Balance the resources needed to meet multiple goals; Learn from past actions, projecting future outcomes; and Monitor progress, making necessary adjustments as a project unfolds the learners-to improve teaching effectiveness, facilitate learning among learners, encourage long life learning and maximize motivation as well as reducing the dropout rates. -(A. Battou, O. Baz and D. Mammass, 2017)	SF.CC,A. **SF)**

To answer the second question of the study (Does this application; approve any changes in knowledge, skills, values and attitudes in female students of special education?) we designed an e-questionnaire to solicit female students' opinions about the effectiveness of the Scrum in learning events, achieving learning strategy, and learning goals in teaching the Education Technology course. The result is shown in figures 5 & table 1

Qpr = quality of project results
Qifs=Quality of interaction with fellow students
Qss=quality of self stem
Qp=quality of production
QET=quality of metacognitive thinking
Qia = Quality of interactions with adviser
Qr=Quality of student's responsibility
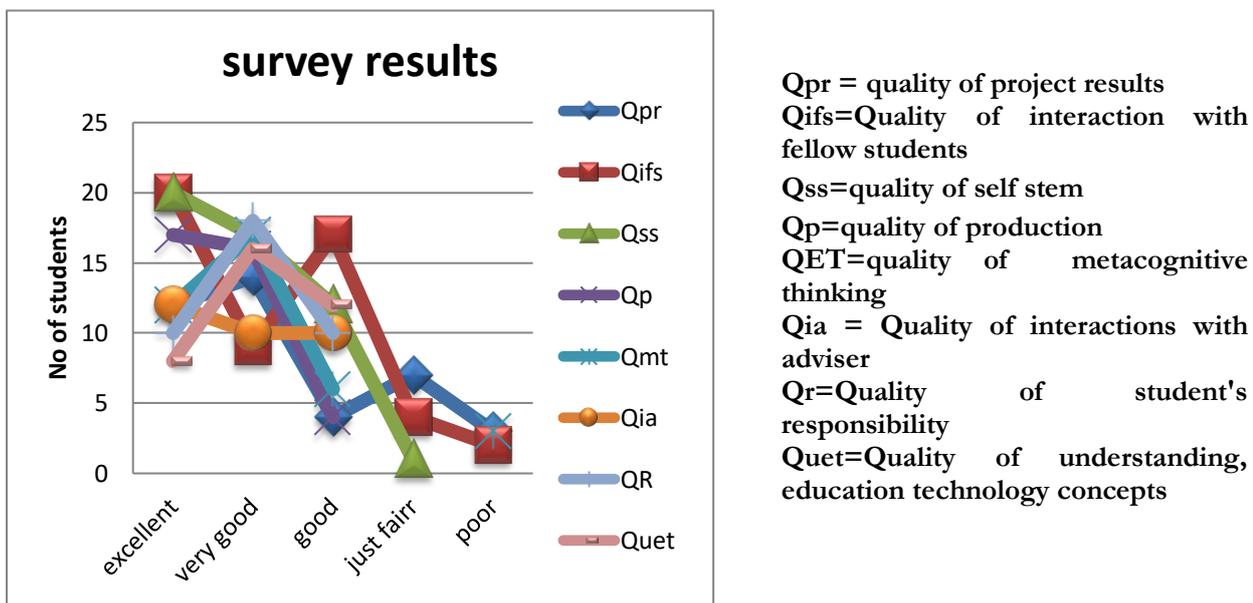Quet=Quality of understanding, education technology concepts

Fig . Female students' responses to the questionnaire the effectiveness of the Scrum in education.

Interview findings and theoretical insights from motivational theories suggest that the Scrum methodology provides a coherent set of learning skills that promote student learning in context-based approaches at least in four different levels.

First, at the beginning of a context-based program, The Scrum methodology forces the teacher and students to explain its purpose. As a result, its complexity is decreasing, and the real-world issue is becoming less overwhelming. Secondly, the reviews illustrate in particular the concepts that play a major role. Thus, uncertainty about what to learn in the end-of-term tests pales. This, however, requires a redesign of context-based approaches. Developing an

exciting real question is not enough. It should be accompanied by carefully developed tasks and appropriate reviews. Third, the Scrum celebrations and artefacts facilitate student collaboration and self-organization. Regular and explicit attention to these high-level skills may lead students to better prepare for their future lives in which lifelong learning may be an integral part. Fourth, The application of the Scrum methodology in this curriculum has changed teaching process. Rather than just delivering content, we faced a more facilitating role in which he discussed conceptual issues as well as the metacognitive aspects of learning, including collaborative learning, and learning strategies

4. Recommendations

Clearly, the teacher's role is invaluable in implementing both context-based approaches and the Scrum methodology. So scrum ceremonies take time and effort to know and develop the right tasks. It is necessary to have a guided oversight in well-designed professional development programs for the teacher to   well-trained to use scrum a strategy.

5. Acknowledgement:

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