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APPLICATION OF THE SCRUM FRAMEWORK AS A PEDAGOGICAL STRATEGY FOR COLLABORATIVE MANAGEMENT

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ABSTRACT

Agile methodologies can be described as a flexible management tool that can be applied in various fields, such as education. The Scrum method is an agile methodology that allows the team to work on different types of projects. Aiming to introduce agile methodologies in the educational field, this work was developed with the application of the Scrum method in a college classroom, where the students acted as the Scrum Team and the teacher as the Product Owner. The project was based on the application of agile methods to the writing of a scientific article. To this end, the students were divided into 3 teams, each of which had as its product the writing and publication of a scientific article. The inclusion of tools such as 5W2H and Trello served as allies in the development of the project, bringing a significant increase in the performance and communication of the teams, thus proving that the combination of strategies allows the teams to perform better in the delivery of the product.

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INTRODUCTION

Agile methodologies, known as Agile Project Management (APM), are described by Otero et al (2020) as a flexible management tool that can be applied in many fields, such as education. Although created to manage projects such as software development, this methodology has the ability to help project members with self-organization and team collaboration, as well as other soft skills.

The Scrum method is an agile methodology that allows the team to work in different types of projects due to its customized framework. To apply this tool, the project needs a product owner and a Scrum team with a designated leader, called Scrum Master, whose role is to drive the team to succeed in the project by helping the other members with obstacles and keeping the product owner aware of the project, for example (SRIVASTAVA, 2017; SCHWABER et al, 2002).

According to Schwaber and Beedle (2002), the product owner is the person officially responsible for the project and for defining the project backlog. This backlog is a list of everything that needs to be done until the end of the project, ordered by priority. It can be features, functions, technology enhancements, or bug fixes. Later, it will be turned into Sprints, which are the team's goal to achieve and work during about three days, by the Scrum team. Another responsibility of the team is to do whatever is necessary to achieve the Product Owner's project and to turn the Product Backlog.

Bringing agile methodologies into the educational field, an academic project can be developed using the Scrum method, with the students as the team and the professor as the product owner. This type of project management allows students to develop collaborative and soft skills such as negotiation, problem solving, flexibility and commitment (POPE-RUARK, 2012). The aim of this paper is to describe the use of this different methodology by three groups of students, helping them to write and publish a research article.

METHODOLOGY

The project was based on the application of agile methods to article writing, following the guidelines of Schwaber and Sutherland (2020) with adaptations. Three teams of 3rd period students were formed, and each team would have as its final product the writing and publication of an article.

The professors of the University Center were in charge of the product of this project, and the Scrum Master of each team brought information specific to the delivery, based on

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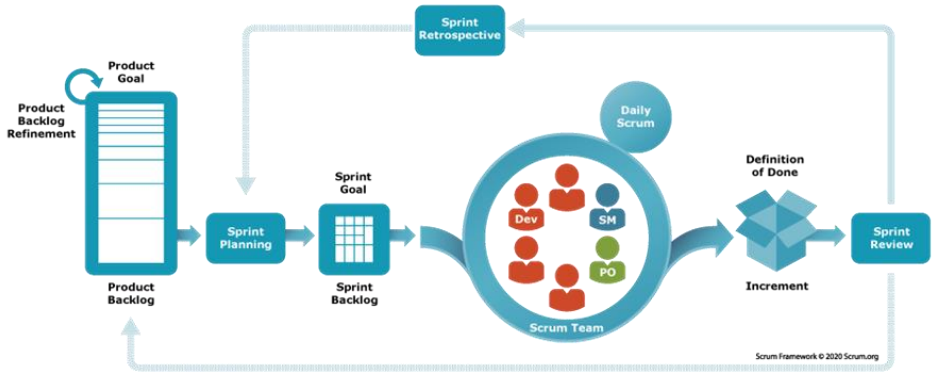
the request of the "client". Thus, a brainstorming was conducted to create the main topics of the sprint and the action plan. During the first meeting with the team and the client, the central idea of the project was explained, which was the basis for the implementation of the Scrum methodology (Sutherland, 2019).

The project was carried out by forming development teams using the Scrum methodology, each consisting of a Scrum Master and four other members. At the beginning of the project, the meetings were adapted from daily to weekly, with the presence of all team members, and the meetings lasted a maximum of 10 to 15 minutes to receive feedback from the team (Schwaber, 2017).

Figure 1: The structure of the Scrum methodology.



Source: Scrum.Org (2020).

The proposal was to divide the project into partial steps, with a deadline of about 15 to 20 days. Each step would be a part of the article to be written, the first being the introduction and materials and methods; the second being the results, discussion, and conclusion; and the third being the full article with conclusion, abstract, and translation.

The team designed the project sprint, which summarized the phases of the project's development and the tasks to be performed by the members during the specified time period. The activities of each step were incorporated into Kanban, an agile improvement method that makes adjustments in the workflow to achieve more efficient results in a shorter period of time. The Kanban board is divided into phases such as "Backlog" where the activities were listed, "Analyze", "Develop", "Test", and "Deploy". The steps are divided into columns in the board, which are divided into sub-columns, "Doing" and "Done", the activities are represented by a card placed in a particular sub-column according to their status, for example, "Analyze" or "Deploy" (Ahmad, 2016).

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It was integrated into the Trello platform and covered everything from writing the abstract to reviewing and editing the text. Each team member was responsible for some of the activities and developed the action plan. The action plan was developed using the 5W2H framework, which, according to Silva (1994), allows for systematic planning and improves productivity, safety, organizational climate, and motivation. The action plan captured the activities, deadlines, and team member assignments, as well as the status until the tasks were completed. The entire project was designed to track the delivery schedule and to compile the skills of all team members.

RESULTS AND DISCUSSION

In the present study, the three selected groups of the College of Pharmacy were able to deliver one article each within the duration of the school semester. The facilitated communication among the group members due to the implementation of the agile methodology using Scrum was the essential key to the publication of the three English papers in the scientific journals qualis capes A3 and B2. Furthermore, parallel to the scientific writing, the groups developed and presented their respective projects in the II Brazilian Pharmaceutical Science Congress.

The successful delivery of both complex projects that relied on the groups was only possible due to the use of agile methodology, which provided the tools needed to increase communication throughout the process, as well as student productivity and time management. Rico e Sayani (2009) also described the work of three different groups, however in their research the groups had different tools and agile methods in which it was possible to notice that the team with little exposure to agile methods was the one that struggled the most with cooperation and teamwork when compared to the ones that were able to use more agile methods to their advantage. Due to the extreme importance of teamwork in many fields and companies, it is possible to see the benefits of using agile methodology in college to prepare students for future challenges.

Moreover, agile projects can lead to better, faster and more economical results. Azanha et al. (2017) demonstrated the effectiveness of using agile methods in system development for a pharmaceutical industry, where it was possible to complete the task three months earlier than the estimated time and with a cost reduction of about 50%. This data shows that the time and productivity improvement was not an isolated event in our work, but a consequence of using agile tools.

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In addition, another study conducted by Pries-Heje e Pries-Heje (2011) with two IT groups in different countries aimed to find out why Scrum works. According to their findings, the daily Scrum was able to provide opportunities for team members to interact and learn what the others were doing, which increased the trust of the teams. In addition, performance confidence was also improved by the small deliveries and quick feedback at the end of each sprint, and the project manager was able to closely monitor performance in the daily Scrum meetings. To summarize the experiment, using Scrum helped the team to clearly understand the overall work and its specific tasks, as well as the expectations of the project and the ongoing tasks. This framework improved the coordination of work and established effective mechanisms for tracking progress, which made the employees feel more committed, help each other, and achieve their goals with pride.

The improvements mentioned by Pries-Heje e Pris-Hege (2011) using the Scrum framework were also found in our study, although the behavioral analysis was not thoroughly detailed, the agility and quality delivered by all groups in their work support the facts that Scrum was essential to improve performance trust, coordinated work and other parameters as reported by them.

CONCLUSION

The success of a project requires planning, not only a skilled team, but also the use of strategic resources. Agile methodologies have been used for decades by companies in a variety of industries and have been used as a research tool in academic institutions.

Using a combination of resources can contribute to the overall success of the project, and initial training during the planning phase of the agile tool implementation can enhance the team's experience. The final delivery may show an increase in quality that will satisfy both the team and the product owner.

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REFERENCES

1. Ahmad, M. O., Kuvaja, P., Oivo, M., & Markkula, J. (2016). Transition of software maintenance teams from Scrum to Kanban. In *2016 49th Hawaii International Conference on System Sciences (HICSS)* (pp. 5427–5436). IEEE. https://doi.org/10.1109/HICSS.2016.670

2. Azanha, A., Argoud, A. R. T. T., Camargo Junior, J. B. D., & Antoniolli, P. D. (2017). Agile project management with Scrum: A case study of a Brazilian pharmaceutical company IT project. *International Journal of Managing Projects in Business, 10*(1), 121–142. https://doi.org/10.1108/IJMPB-06-2016-0054

3. Pries-Heje, L., & Pries-Heje, J. (2011). Why Scrum works: A case study from an agile distributed project in Denmark and India. In *2011 Agile Conference* (pp. 20–28). IEEE. https://doi.org/10.1109/AGILE.2011.34

4. Rico, D. F., & Sayani, H. H. (2009). Use of agile methods in software engineering education. In *2009 Agile Conference* (pp. 174–179). IEEE. https://doi.org/10.1109/AGILE.2009.13

5. Schwaber, K., & Sutherland, J. (2017). *The Scrum Guide™*. Scrum.org.

6. Silva, J. M. (1994). *5s: The environment of quality* (2nd ed.). Fundação Christiano Ottoni, Escola de Engenharia da UFMG.

7. Sutherland, J., & Schwaber, K. (2020). *The Definitive Guide to Scrum: The Rules of the Game*. Scrum Inc.

8. Scrum.org. (2020). What is Scrum. Available at: https://www.scrum.org/resources/what-scrum-module