

Virtual Gemba Analytics for Experiential Learning

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ABSTRACT: When developing a project, input from stakeholders is a key to success. In this paper, a Virtual Gemba Walk dashboard for virtual capstone projects is proposed. A Virtual Gemba Walk aligns the expectations of the three stakeholders: student, teacher and industry sponsor through a real-time analytics dashboard that visualizes project indicators, tracks progress and identifies misaligned expectations. This poster presents a proposed interactive dashboard, that leverages data from technology to support the Virtual Gemba Walk process. The dashboard contains key indicators of the capstone project, triggers new Gemba Walks and visualizes feedback from each stakeholders' perspective. The aim is to help students, teachers and industry sponsors to get meaningful feedback for a better chance of project success.

Keywords: Gemba Analytics, Learning Analytics, Stakeholders, Experiential Learning

1 INTRODUCTION

A capstone project is a model of experiential learning that brings real-world projects and sponsors into an academic classroom. A capstone project is a complex pedagogical practice to facilitate, online and remote learning paradigms make it even more complex. This poster showcases how learning analytics can be used to align stakeholders. This alignment is achieved by visualizing issues, combining learning activities with indicators of project management, development and success (Reynolds, 2009). Learning Management Systems (LMS) are traditionally a two-way channel between teachers and students but in an industry engaged, experiential learning program like a virtual capstone project, including the industry sponsor in the virtual learning environment is key. Practera, an experiential learning technology designed to support teacher, student and industry sponsor collaboration (James et al., 2020) captures unique data that can be used to implement the Virtual Gemba Walk process.

Gemba has roots in the Japanese culture and means 'the real place', which in Lean methodology was applied as the place of work where value is created (Petruska, 2018). The Gemba walk is a method used to engage and showcase the current state of a project to leaders, stakeholders, and clients. The proposed Virtual Gemba Walk is a learning analytics driven presentation made by a student team highlighting key project indicators including, project progress and key deliverables.

This poster presents a proposed learning analytics driven Virtual Gemba Walk dashboard prototyped using teacher, student and industry sponsor collaboration data from an experiential learning technology. The Virtual Gemba Walk dashboard supports a remote capstone project team to visualize their progress for teachers and industry sponsors. Additionally, through the Virtual Gemba Walk dashboard Sponsors can identify potential project improvements, flag issues or request further feedback.

2 VIRTUAL GEMBA WALK EXPLAINED

2.1 Data Used

To create the dashboard, the data was acquired from the experiential learning technology. The platform captures data points related to the student use, behavior and completion of project tasks. The student engagement metrics captured include number of project tasks completed, learning content completion, project deliverable submissions, team communications, achievement of badges and points to recognize project performance. Moreover, the technology also captures teacher's interventions, industry sponsor feedback and perspectives on the students' project engagement and project progress. Those indicators were analyzed and used as Key Performance Indicators (KPI) in the Virtual Gemba Walk dashboard.

In addition to the existing data captured by the experiential learning platform, a new data set is proposed to add valuable insight to the Virtual Gemba Walk process. Finally, the Virtual Gemba Walk itself generates feedback that contains a flag indicator based on the status of the project from the perspective of the industry partners, students and teachers and written feedback.

2.2 Purpose

As mentioned previously, a traditional Gemba Walk is a process in which a stakeholder would meet with a team to view the status of the project. In a Virtual Gemba Walk, the industry partner can trigger it manually at any time to assess, evaluate and provide feedback on the project progress. The key purpose of a Virtual Gemba Walk is not only to get effective feedback from the industry Sponsors, but to build trust and develop more effective teams (Gasevic, Dawson & Siemens, 2016).

2.3 Goals & Objectives

The main goal of a capstone project is for students to successfully apply concepts they have learned in the classroom to a real-world project. This is the key factor that can be analyzed, predicted and visualized using a learning analytics driven Virtual Gemba Walk dashboard. However, there are additional factors like work habits, teamwork skills and project quality that are difficult to map using existing data from the technology (Scholes, 2016). The additional feedback provided by students, industry sponsors and teachers during the Virtual Gemba Walk process can provide this additional data not captured by the platform itself.

The overall objective of the Virtual Gemba Walk is student success. In a capstone project this includes processes and indicators that are not just related to learning (Verner, Evanco & Cerpa, 2007). The analysis that produces the Virtual Gemba Walk dashboard uses student success as the focal point. Specifically, it used in a regression model to understand how other variables might affect the level of student success. The regression analysis is done by taking into consideration the correlation between variables and the normalized impact that each variable has on the target variable, student success. The multiple regression is built using the measurements from the student usage of the experiential learning technology, and the results will be used to define the KPI's displayed on the dashboard.

2.4 Visualization

The dashboard is divided into three cards. The first contains indicators about individual students, the second is about the team, and the third is a visualization based on the regression analysis (See Figure 1). The first shows individual indicators including submissions, assessments and achievements. The second shows team indicators including team submissions, assessments and achievements. The third is based on Industry Sponsor feedback and the regression analysis. partner) regarding the final Virtual Gemba walk.

The students can view their own indicators and their team's. The educator and industry partner can choose which team and student they want to visualize.

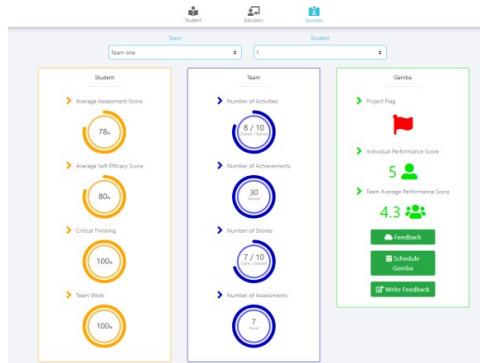


Figure 1: Virtual Gemba Analytics Dashboard for Experiential Learning

3 CONCLUSION

The purpose of the Virtual Gemba Walk is to improve students' success in experiential learning project. With the Virtual Gemba Walk, students will get a more real professional experience as they are presenting to and receiving feedback from the industry partner often. Additionally, the Industry sponsor will have a greater understanding of the project development, giving them more confidence in the success of the project.

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5 REFERENCES

Gasevic, D., Dawson, S., & Siemens, G. (2014). Let's not forget: Learning analytics are about learning. *TechTrends*, 59(1), 64-71. doi:10.1007/s11528-014-0822-x

James, N., Humez, A., & Laufenburg P. (2020). Technology to Scaffold Experiential Learning. *TechTrends*, 64, 636-645.

Petruska, R. (2018). *Gemba Walks for Service Excellence*. Productivity Press.

Reynolds, M. (2009). Wild Frontiers—Reflections on Experiential Learning. *Management Learning*, 40(4), 387-392. doi:10.1177/1350507609335848

Scholes, V. (2016). The ethics of using learning analytics to categorize students on risk. *Educational Technology Research and Development*, 64(5), 939-955. doi:10.1007/s11423-016-9458-1

Verner, J., Evanco, W., & Cerpa, N. (2007). State of the practice: An exploratory analysis of schedule estimation and software project success prediction. *Information and Software Technology*, 49(2), 181-193. doi:10.1016/j.infsof.2006.05.001