

CONTINUING TO ASSESS PROJECT MANAGEMENT: WHAT'S BEEN DONE? WHAT'S IT MEANS? LOOKING AT NEW TWISTS

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ABSTRACT

A question posed for institutions of higher learning is how can student outcomes it desires in graduates be assessed to ensure compliance with educational standards? In summer 2004, the State legislature directed universities and colleges to develop key Academic Learning Outcomes (ALO) that meet the established Academic Learning Compacts in curriculums. The State wants students to be able to perform an ALO like Project Management (PM) and it requires this learning domain to be measured and evaluated.

Everyone at our university (i.e. students and faculty) are project managers having tasks and requirements to complete prior to graduation. For example, College of Business (COB) students must successfully complete a business policy analysis and formulation course. This course engages student teams to compete in a business strategy simulation. Students are responsible for PM activities that structure, organize, and assess the simulation effort throughout the semester. Rubrics have been developed to evaluate teams and individual students on sound practices as defined in the ALO for PM. Each competing team has the opportunity to be the simulations best performing group by applying learned PM skills. Teams must balance a myriad of performance factors using methods and techniques learned in COB core courses to craft and execute selected business strategies. A rubric, evolving since 2006, is used to evaluate and assess student performance of the PM learning outcomes. Team members, not faculty, rate each other on their performance of each PM activity. This evaluation and the final team simulation performance standings are then used to assess if the PM ALO has had an effect on final simulation performance.

INTRODUCTION

A continuing priority at academic institutions today is how to assess the academic engagement of students in studies. The accreditation processes of the Southern Association of Colleges and Schools (SACS) and our university's recent Association to Advance Collegiate Schools of Business (AACSB) re-accreditation has led to new university- and college-level directives about academically engaging students. With new AACSB accreditation and maintenance standards in 2003, the State and our university developed and mandated a list of five overarching College of Business (COB) academic learning outcomes (ALO): a) critical thinking, b) communication, c) ethics, d) project management, and e) domain knowledge. Graduates are expected to be able to demonstrate proficiency in each application prior to graduation. The development, testing, and measurement of all five ALO is a work-in-process. One of the more difficult rubrics to refine is "how to capture" the project management (PM) ALO. An evolving PM rubric was used in 2008 to assess PM learning outcome as part of our COB capstone course: MAN4720 Business Policy and Formulation.

The goal of this paper is to continue analyzing whether an ALO like PM can be assessed using experiential exercises, like simulations, and if there are new ideas that can help to further explain PM to students. This goal can be accomplished in three ways: 1) "what has been done?" Explaining how a PM Academic Learning Outcome (ALO) was first established and prior results, 2) "what does it mean? Summarizing the course, the simulation, the Spring 2008 PM rubric, and results, and 3) "can new twists be added?" To aid the evolving project management rubric and the subsequent PM peer evaluations done by teams.

WHAT'S BEEN DONE?

Curriculum Direction. In 2003, the AACSB adopted new accreditation and maintenance standards, and in 2004, the State Board of Governors changed university policies to require all State universities to implement Academic Learning Outcomes (ALO) for baccalaureate and graduate degree programs. An ALO identifies what graduating student should be able to do after graduation including: 1) content or discipline concepts, theories, and frameworks, 2) critical thinking that encompasses managing information, higher-level cognitive skill sets, problem solving, and creativity, 3) communication that involves written, spoken, quantitative, and technological skills as appropriate to each discipline, 4) integrity/values that include decision making, academic integrity, and professional standards for discipline integrity, and 5) project management that analyzes a discipline's project planning and execution. These directives require corresponding rubrics be developed for each outcome area to assist in determining how well student learning matches articulated expectations (Association to Advance Collegiate Schools of Business, 2003; Collegiate State Board of Trustees – Academic & Student Services Committee Meeting, August, 2004). Our university programs are also approved to present ALO that accomplish discipline specific skill sets and outcomes to distinguish our program graduates who accomplish learning outcomes not specified within the five domains listed above. (Association to Advance Collegiate Schools of Business, 2003; Quality Enhancement Plan, January 2005).

Prior results. PM studies have ongoing since 2005. The college performs learning outcome assessments every other year. PM ALO is officially assessed every Fall semester and has occurred in 2005, 2006, and 2008. The next assessment is planned for fall 2010. The results from prior studies are in Table 1. Results indicate a variable result through the years that is explained later.

WHAT DOES IT MEAN?

MAN4720 Course. MAN4720 is our COB' capstone course. All business students must take this course the

semester prior to graduation, making it an ideal opportunity to assess the learning outcomes of our graduates-to-be. The course focuses on a typical business policy and formulation agenda that includes covering basic strategic management theory, case analysis, financial analysis, and a business simulation. The course goal is to compile multiple course elements in order to assess several college-level ALO and learning domains. The key course evaluation components include exams & quizzes (40%), case discussion and analysis (30%), and a business simulation (30%). The course's simulation element is completed by groups of 3-4 self-selected team members. Teams have total control over making and submitting simulation decisions on dates identified in the course syllabus.

The experiential learning elements of this course use a Total Enterprise Simulation called Capstone Business Simulation (CAPSIM Student Guide, 2009) by Management Simulation, Incorporated. This business simulation follows the yearly activities of a \$100M sensor manufacturing organization over a period of 8 years. Each team formulates and implements strategy and tactics as it competes in the marketplace. Early in the semester, student teams use rehearsal rounds to learn the basic decisions required in the simulation's environment. When the rehearsal rounds are finished, four practice rounds are done to help the cement learned simulation decisions and to reinforce proper strategies. The team's then begin eight years of simulated firm operations. Firm operations demand teams plan and execute all research and development, production, marketing and financial decisions. Each decision, equaling one year of operations, results in team rankings based on the combined performance of return on equity, cumulative profit, market share, and market capitalization. These variables have been selected as the best measure of course ALO.

Can an ALO be measured by applying simulations? Use of simulations to capture strategic management ALO has been previously articulated in simulation and experiential learning literature. Using Wellington & Faria's (1995) research findings, Peach (1996) identifies a positive relationship exists between simulations and strategic management. Basic strategic management tenets are seen when simulations are used and participating teams develop

Summary of PM Student Performance

Table 1

Rating	Unacceptable	Acceptable	Exemplary	Total
1995				
Number	7	31	51	89
%	8%	35%	57%	100%
1996				
Number	6	73	32	111
%	5%	66%	29%	100%
1998				
Number	12	68	3	83
%	14%	82%	4%	100%

Table 2

Assessment of Project Management Skills in the Capstone Course -- Fall 2008

Name of Team Member: _____ Team: _____ Self-Assessment: _____

INSTRUCTIONS: On a separate form for each team member, including yourself, place an X to identify level project management efforts. Use the rating definitions below for your answers.

1. **UNSATISFACTORY:** Team member failed to provide minimal contributions for input point. Team member had a large negative impact on team performance creating extra work for other team members with late/unsatisfactory effort.
2. **BELOW EXPECTATIONS:** Significant or repeated shortfalls in performance that negatively impacts overall team performance. Team member did not significantly modify behavior after being advised of problems.
3. **MEETS EXPECTATIONS:** Team member generally performed in a manner reflective of a serious, contributing member. May have committed occasional minor errors (e.g., late to meetings) but not to the extent it was a negative impact on the team. May have occasionally done extra work or put in extra effort, but of the type you would expect a team member to reasonably do.
4. **EXCEEDS EXPECTATIONS:** Team member consistently performed in a manner beyond what would be reasonably expected, and was a strong positive influence on the team and its performance. May have done significant extra work, helped other team members with their tasks, or provided extra effort wherever needed.
5. **WELL EXCEEDS EXPECTATIONS:** Team member consistently performed task far beyond reasonable expectations, & measurably improved team's overall performance. This category is for rare occasion of truly superior performance.

A. Project Planning	1	2	3	4	5
In this section, assess performance concerning the team's approach to planning the project. Pts.	Unsatisfactory	Below	Meets	Exceeds	Well Exceeds
Identify Required Tasks 5					
Assign Responsibilities for Tasks 5					
Establish Deadlines for Tasks 5					
Agree On Performance Expectations 5					

B. Individual Work Skills	1	2	3	4	5
In this section assess tasks accomplished individually to the best of your knowledge. Pts.	Unsatisfactory	Below	Meets	Exceeds	Well Exceeds
Sets appropriate goals for completing individual tasks 5					
Manages timeframe and schedule appropriately 5					
Completes all individual tasks in a timely manner 5					
Completes all individual tasks with appropriate quality 5					

C. Team-Work Skills	1	2	3	4	5
In this section, grade performance as a team member towards accomplishing team objectives. Pts.	Unsatisfactory	Below	Meets	Exceeds	Well Exceeds
Contributes positively to accomplishing team objectives 5					
Effectively completes responsibilities 5					
Effectively mediates conflict among team members 5					
Participates in all scheduled team activities. 5					
Responds effectively to feedback 5					

D. Project Delivery	1	2	3	4	5
In this section, assess the impact of the team member's performance on the overall final project. Pts.	Unsatisfactory	Below	Meets	Exceeds	Well Exceeds
Team projects delivered on time 5					
Effectively complied with project requirements 10					
Makes valid suggestions for improving process & product 10					
Able to accurately assess quality of personal contribution 10					

Total Project Management Points: 100

Exemplary: 85 – 100 points

Acceptable: 60 – 84.9 points

Unacceptable: <= 59.9

clear objectives, analyze both the external and internal environments, articulate strategy choices, monitor performance results, and take required corrective measures. Competitive simulated environments require students to exercise basic PM skills that ensure all required activities are accomplished.

Rubrics Used. The COB uses the MAN4720 course to assess the mandated learning outcomes of: 1) Content, 2) Critical Thinking, 3) Communication, and 4) Project Management. The first three learning outcomes are assessed in the Spring semester with the completion of an individually written student case analysis. PM skills are assessed using an evolving rubric in which each team member analyzes the PM elements performed by their team to complete the simulation. The rubric used in Fall of 2008 is in Table 2.

The Spring 2008 PM rubric evolved from rubrics developed in 2005 and 2006. This rubric resolves instructor-identified problems through the use of suggested interventions. For example, previously used rubrics did not capture student's PM skills because instructors varied on how the rubric was administered in a given semester. The Fall 2008 PM rubric clearly defines the dimensions of project management learning outcomes. All team members must rate each other as well as themselves. So when evaluating a four-person team, each person must provide a PM evaluation for each person plus themselves, marked as a self-assessment. Learning outcome measures are collected into a PM score by summing the individual team member's scores. PM scores are categorized as exemplary: 85-100, acceptable: 73-84.9, and unacceptable: less than 73. Thus, a team member's individual project planning, self-regulation, teamwork, and project delivery rater's score are summed and averaged to create the team PM skill rating categories of being exemplary: 85-100, acceptable: 73-84.9, and unacceptable: less than 73.

Project management. This rubric uses a definition of a project as "a complex, non-routine, one-time effort limited by time, budget, resources, and performance specifications designed to meet customer needs" (Gray & Larson, p. 5, 2008). This definition parallels exactly what a simulation provides to participants as they perform in their businesses activities. In MAN 4720 the major project characteristics of the simulation are 1) an established objective – attaining the top simulation score, 2) a defined life span – simulation lasts eight decision periods, 3) involving multiple operators and departments – each team operates in a six company industry, 4) something never been done before – each industry is unique and non-routine, and 5) having specific time, cost, and performance requirements – team decisions control their organization's destiny (CAPSIM Guide, 2009; Gray & Larson, 2008). PM is defined as "the task of getting the activities done on time, within budget, and according to specifications" (Robbins & DeCenzo, p415, 2004) which typically includes three phases: planning, scheduling, and controlling (Heizer & Render, p56, 2004).

The measurement of PM has been evolving. A Quality Enhancement Program (QEP) task force involving the three university colleges (Professional Studies, Art and Science, and Business) was formed to design a PM rubric to assess this learning outcome. The task force suggested PM measurement should contain the domains of: 1) project conceptualization, where students select projects, resources, and execution plans, 2) individual self-regulation of goal completion, managing appropriate timeframes, and demonstrating quality contributions, 3) teamwork skills including practicing ethical judgment, managing conflicts, and contributing to quality teamwork activities, and 4) project deliverables, an on-time, acceptable product, effective oral and/or written presentations of results, effective feedback to questions, and determining good improvement recommendations. These PM suggestions were evaluated and combined in our Fall 2008 PM rubric (See Table 2).

The Fall 2008 PM rubric first measures project planning by the identification of tasks, responsibilities and deadlines. Secondly, individual skill sets are measured by documenting individual team member's ability to set goals, manage timeframes, and quality completion of tasks. Thirdly, team skills are shown by examining student contributions to accomplishing objectives, mediating conflicts, responding to feedback, and participating in all team activities. Lastly, the rubric asks if each team member aided the projects on-time delivery, helped meet project requirements, contributed simulation suggestions, and made high quality work contributions. This rubric attempts to define and quantify what PM entails by assessing the key PM activities in order to accurately successfully capture views of PM across the university and its colleges.

The PM rubric is administered at the end of the semester. Instructors measuring the course's ALO use the information gained to improve future student performance. Using rubric results instructors are able to offer suggestions to the teams on the business behaviors that provide the most value to team efforts such as mandating team contracts that assign specific tasks to team members. MAN4720 instructors are currently working on additional approaches to enhance student performance by analyzing information gleaned from the 2008 PM rubric.

ADDING NEW TWISTS

This PM rubric continues to evolve and develop. The future PM rubric evolution may see investigations into: 1) improving the definition for program management, 2) development of rubric rules of engagement and scoring, 3) expanding PM evaluation by students, and 4) developing new ways to discuss PM.

Project Management Definition. The present PM ALO was defined by the State Board of Governor's directive in 2004. Specifically, the corresponding assessments or rubrics must be identified and developed to determine how well student learning matches the articulated expectations.

A deeper definition of successful PM needs to be developed to reflect success as more than simply completing the course work. Presently, the COB is working to improve the embedding of PM skills throughout the entire curriculum with a PM ALO being developed for each course.

The PM task force suggested that project management areas of project planning, self-regulation, teamwork, and deliverables be developed after long discussions between the various colleges and departments. Using task force developed PM areas as a guide; the Fall 2008 PM rubric was developed. Adjustments were made to eliminate repetition of concepts such as “assess quality” and “develop plans” in every learning outcome. The Fall 2008 rubric attempts to define and quantify what PM entails by focusing on the key PM activities to be assessed.

Rubric Rules of Engagements (ROE) & Scoring.

Strong ROE are needed when using this rubric. The ROE should/must include: 1) raters complete the rubric individually and not as a group, 2) all instructors deliver the rubric the same way: in class, within a 20 minute timeframe, and with no conversation permitted, and 3) each rater completes one rubric for each person in the team and one for themselves. When scoring this rubric for a class of 30 students, administrators will collect 120 rubrics. For multiple classes, the administration of this rubric becomes quite tedious. The use of this rubric in the future calls for the development of more streamlined data collection techniques. This is one of the biggest drawbacks of the 2008 rubric.

Continuing rubric analysis needs to be conducted. For example, a correlation analysis between the final simulation score, team PM scores and each PM rating category should be done. Correlation analysis may show key relationships between team and individual members PM activities and overall simulation performance. Other analysis can also offer new perspectives on how teams organize and construct a project.

Individual's Ratings PM. As various colleges use other PM rubrics, the COB is the only one that tasks team members to rate each group member on their individual contribution to the project. The other colleges have the instructors determine the team overall PM ratings even though they may not actually witness the team activities. It is our belief that PM activity assessments must be made by the people actually involved in, witnessing, and performing the project activities. This means assessments must come from the students themselves. Otherwise PM assessment comes from just seeing a presentation or reading a student report

Also, results from the 2008 PM assessments showed a few students try to score themselves individually better than their team rates them. If a student inflates his/her PM scores compared to the way the team rates them, the difference is easily seen. Since this assessment occurs at the semester's end, the administrators should expand the ROE to include the importance of personal integrity and being ethical in business.

Teaching PM. Implementing a plan of action is a critical step in project management and often introduces change into the project or organization. When implementing and executing a new strategy or project, team members may expect to see questioning and the possibility of resistance within their team. To overcome this resistance to new ideas, a project manager must develop answers to the following questions:

- **How are we going to implement the plan?** This question is best answered by developing ways to organize your team. Can your team operate efficiently with functionally, divisionally, or even matrix structures? Using an appropriate structure helps a project team operate effectively. The project manager can look at what have others project teams have done previously to determine what was effective in past situations and if it is applicable today.

- **Who is going to do it?** Does the project have buy-in from existing employees? How can the project obtain support and commitment from team players? Do project members understand their roles in the revised structure? Have the roles been defined? Does the project team have the skills and competencies to make the jump into new roles? Will the project need to hire additional people? Can employees accomplish the new task while working existing jobs? Do people need to be freed-up to form a dedicated team to accomplish the task

- **What needs to be done?** What skills are required to appropriately implement the project? Do the people designing the project plan have the skills to implement it? Can the project move directly from where it is to our desired destination? If not, what temporary destination(s) does the project move to that allows it to arrive at the final destination? Are the resources (dollars, people) available to implement and execute the project plan? Does a reward structure exist which helps accomplish the project? If not, what reward structure needs to be introduced to improve the probability of a successful implementation?

- **When will the plan be implemented?** Is there flexibility on the date? The project manager needs to obtain answers to these questions and then design the project (organization) so that there is room to deal with unexpected contingencies and/or serendipitous opportunities that may turn up. In other words, a project needs to build flexibility into its plan.

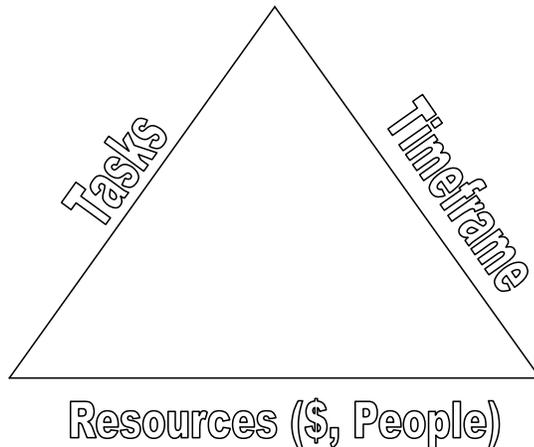
A detailed project plan needs to be developed for any project with specific steps and timeframes associated with each step. To achieve an acceptable simulation grade, all teams must learn to develop project management skills leading to their final CAPSIM performance, strategic plan and Lessons Learned Report (LLR). As future strategic leaders, students should still be able to answer the above four questions areas in order to generate general ideas on how a project plan should be implemented.

Benyon (2009) suggests that all project plans require three equal elements: 1) specific tasks that need to be accomplished, 2) timeframes in which the tasks are required

to be completed, and 3) resources (dollars and people) (See Figure 1a). Can this pyramid PM model be used to help us assess our current PM learning objective? This model illustrates how the three elements of project management work together to develop a strong, evenly matched, pyramid structure.

Project Management Elements

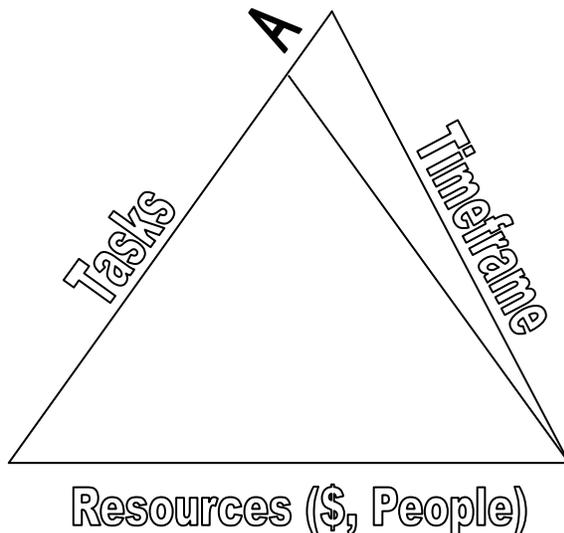
Figure 1a



The literature strongly links the appropriate level of each PM element for strong project operations. What happens if things change? If the project's scope gets expanded (more tasks), but the people resources remain the same, the only way the project can be accomplished is if the timeframe is increased. See Figure 1b where the task is increased by A but note the timeframe has also increased in order to maintain the project's evenly matched pyramid shape.

Project Management Change

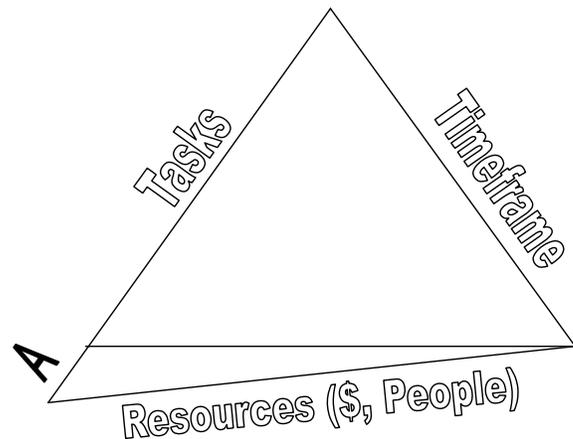
Figure 1b



If the timeframes are not expanded, as a project leader you must either refuse to accept the change in scope or obtain approval so dollars and people resources can be increased in order to maintain the project's pyramid shape.

Project Management Change

Figure 1c



These figures beg the question, can the Fall 2008 PM rubric domains of project planning, individual/team work skills, and project delivery be substituted as the key elements used in Figure 1a, 1b, & 1c? This is another direction in the quest to assess the program management skills involved in the current simulation.

CLOSING THOUGHTS

This paper attempts to answer the opening question, "Can the student learning outcomes that academic institutions desire for graduates be assessed and ensure compliance with educational standards?" Our university's assessment experience provides suggestions on the use of specifically designed PM rubrics to measure State-directed learning outcomes. Rubrics that are developed carefully may be able to ensure that students learn that the best PM practices are powerful tools that can promote operating excellence and better execution for all organizations. To be valuable and transferable for organizations, the best practices must be able to demonstrate success over time, deliver quantifiable, positive results, and be repeatable (Thompson, Gamble, & Strickland, 2004). Whether these identified PM activities are repeatable in the future or in other situations requires further study. The answer depends on whether PM activities can be more clearly defined and measured. This is where our evolving PM ALO is today. Further modifications of this PM rubric may occur as we investigate further in to the "new twists" areas of our PM study leading into 2010.

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