

STUDENT ADVISEMENT USING GANTT CHARTS: AN EXPERIENTIAL EXERCISE IN MANAGEMENT THEORY

Charles A. Nichols,
Piedmont College
cnichols@piedmont.edu

ABSTRACT

This experiential exercise proposes a learning environment based on a physical representation of material covered over the span of one semester in a Management fundamentals class. The method of acquiring knowledge during this exercise is from taking an activity and turning it into an experiential learning exercise producing tacit knowledge. This exercise was originally designed for an entry-level course in Management fundamentals; however, it could easily be adapted for courses in Production and Operations, Human Resource Management, and, perhaps more. The calculations and discussions go only an inch deep, due to the introductory nature of the course.

INTRODUCTION

Over the past three years, I have been using the following exercise in my classroom to get my students engaged with the subject matter. It was never my intention to offer this exercise for more than what it is—a fun, easy-to-setup, interesting practicum that gets the students off the bench and into the game. Professors, who observed this simulation, encouraged me to share this exercise with others in the field because it can be so easily adapted to illustrate so many different Management ideas. For, as my students have discovered, Yogi Berra was right, “You can observe a lot just by watching.” (Berra, 2008)

This exercise engages students to use a Gantt chart to perform a rather mundane task – planning a course of study for the remainder of their college days. Initially the students are given instructions on how to do self-advisement. Then, materials are distributed that will be necessary for the completion of the assignment. The duration of the simulation runs about one hour, but can be shortened to fit into a 50 minute period.

HENRY LAURENCE GANTT (1861 – 1919) - BIOGRAPHY

Henry Gantt (1861-1919) worked with Frederick Taylor at all three steel plants and, as a consultant, revisited Taylor’s incentive plans. Gantt devised a chart that is still used to determine worker productivity. This chart evolved over the years

and is known as a “*Gantt Chart*.” Henry Gantt developed his chart in 1911 and perfected it during the First World War. Gantt utilized the efficiency of measurement to improve productivity. Additionally, Gantt focused on motivation associated with rewards for positive productivity rather than concentrate on punishment associated with negative productivity. He is credited with developing a wage system that guaranteed the worker a minimum wage. This wage system allowed bonuses for workers who met or exceeded goals. Gantt’s chart is used today to track a variety of activities; including, action items and project and production activities. (Forrer, 2006)

THE GANTT CHART

A Gantt chart is a type of bar chart that illustrates a project schedule. Gantt charts illustrate the start and finish dates of the terminal elements and summary elements of a project (Going, 1919). It is a simple, yet quite comprehensive, system for keeping track of any type of project, whether for industry or personal purposes.

In fact, according to Henry Gantt, the “principles upon which this chart system is founded are easily comprehended:

First: The fact that all activities can be measured by the amount of time needed to perform them.

Second: The space representing the time unit on the chart can be made to represent the amount of activity which should have taken place in that time.

Bearing in mind these two principles, the whole system is readily intelligible and affords a means of charting all kinds of activities, the common measure being time.” (Forrer, 2006, pp. 131)

This chart, which has endured for over 100 years, is still a great tool for planning and organizing almost any task. This is why I chose this methodology for an illustration of management principles. I have found that once students

complete this assignment, they are amazed to find out that, what seemed so difficult (i.e., self-advisement), has now become a relatively simple task. I am certainly not the first Professor to use Gantt charts as a means of illustrating the planning and tracking of work. Byers and Cannon (2007) offered an example of the use of a Gantt chart in their “Programming Game” for mapping all project deliverables. Additionally, Yermish, Boyer, et al (1999) used a Gantt chart to organize the control of the project in their Honor’s Project entitled, “So you want to run an NFL Team.” I am also quite certain that Gantt charts will be around for at least another 100 years, perhaps tracking inter-galactic space travel, or building projects in locations we can now only imagine.

THE SIMULATION

LEARNING OBJECTIVES

This exercise provides a physical demonstration of the following management principles:

- The four (4) functions of Management: Planning, Organizing, Leading, and Controlling (Fayol, 1930)
- Efficiency and Effectiveness (Gilbreth, 1911; & Kanigel, 1997)
- The Value Chain and its analysis (Porter, 1985)
- Job design and analysis, job rotation, job enrichment, job enlargement (Hackman & Oldham, 1980)
- The Gantt Chart (Gantt, 1919)

Schedule the simulation after the explicit material, on the preceding topics, has been covered.

SUPPLIES NECESSARY

For students to be able to complete this exercise, they will need the following items (see attachments):

1. Excerpts from the College’s current catalogue showing General Education and the course requirements for concentration/major field of study.
2. Advisement Spreadsheet (explained later).
3. Blank Gantt charts (flow charts) complete with color-coded empty boxes for students to fill in for their course requirements.

SETTING UP THE DEMONSTRATION

Copies of the supplies mentioned above should be laid out on a table in the front of the room in the order that they will be distributed. You should allow for extras, as some students have some difficulty in getting the right sequence of classes, considering prerequisites.

EXPLANATION OF EXERCISE TO CLASS

I explain the exercise to my class as follows:

“Welcome to Self-Advisement 101, using Gantt Charts. As you will recall, Henry Gantt developed the chart that now bears his names while working with Frederic W. Taylor at Bethlehem Steel. The chart provides a visual representation of the flow of work in progression. What we will attempt to do today is to fill in a chart that will represent your course of study for the next 2 – 3 years. We will be using the following documents to assist us in this endeavor: 1) an excerpt from the college’s catalogue describing the course of study in General Education, Core and Concentration business courses. 2) a copy of an advisement spreadsheet used by the college to keep track of student progress. 3) a blank Gantt Chart (flow chart) for you to map out the courses you need to graduate.”

We complete this exercise in the follow order:

1. The catalogue excerpts are distributed and discussed. (10 minute discussion)
2. The advisement spreadsheets are distributed and students are given an opportunity to explore this document and locate their area of concentration. (10 minute discussion and 10 minutes to allow students to fill in appropriate information for their course of study)
3. Finally, the Gantt Charts are distributed and the students begin to fill in information needed for their course of study.

After the last distribution, the students will have twenty (20) minutes to complete the exercise. Then I allow 10 – 15 minutes for discussion. I then provide some final thoughts and have a wrap-up discussion (5 minutes).

RUNNING THE EXERCISE

COLLEGE CATALOGUE DISCUSSION (SEE ATTACHMENT 1)

Most college students pay very little attention to the college’s catalogue. This is particularly true if advisement is provided for them by a professor or teaching assistant. For many students, this may very well be the first time they have given the catalogue more than a cursory scan. So, you will need to take some time to explain the purpose of the catalogue, and its importance. I begin with the General Education requirements and then move on the College of Business. I then discuss the concept of Core courses, required for every business student. We then discuss Concentrations (or Majors, whichever your school uses). Spend a few minutes here to make sure that every student understands how this all works together to get them to graduation. They are usually eager to find out just how much longer they must “endure” this pain.

THE ADVISEMENT SPREADSHEET (SEE ATTACHMENTS 2a & 2b)

At this point, I distribute the advisement spreadsheet. This instrument was developed by a colleague of mine who is glad to share this with anyone who would wish to use it. You are welcome to come up with your own advisement form. This one is simply the one that I use for advisement (2a). I now take a few minutes discussing the spreadsheet and how it applies to the student's course of study, and how useful this document is to get a quick view of his/her status. I then ask the students to fill in the courses for their concentration (2b).

One other thing, at this point (for the sake of time management) I will concede that most of the students in this class are juniors or sophomores, and that their Gen Ed requirements are most likely complete. I do, however, encourage them to follow up and make sure that they are complete. They do not want any surprises when they get to graduation.

THE GANTT CHART (SEE ATTACHMENT 3)

Once I have distributed the Gantt charts, we discuss how the flow of work is depicted. Each box on the chart represents a task (course) and the arrows on the charts direct the flow of work (prerequisites) to be performed before the next task (course) can be completed. I now give the students about 20 minutes to fill in the appropriate boxes with the courses they will need to graduate.

At this point, I make an effort to see what each student is doing, and I make myself available for any questions they may have. Most students get hung up on the prerequisites, and I spend most of my time explaining the connection. It is sometimes difficult for students to work backwards to find a course that is the prerequisite for another course. Having the arrows on the chart does make this task a little easier.

THE FINAL DISCUSSION AND WRAP-UP

As we near the conclusion of our class time, I get everyone's attention and review what we have just completed. I take final questions and discuss the importance of planning and organizing. It is just as relevant as it was in the days of Henry Gantt. I encourage them to use this document and take control of planning their future, starting with this one little exercise.

CONCLUSION

I have found that my students really get into this exercise. I always get comments along the lines that they have heard all of these terms before, but now they can actually see them in practice and more clearly understand their meanings. There are few moments more enjoyable

than to see the "light" come on in a student's eyes and realize that this student has really, finally understood both theory and application of research.

REFERENCES

- Berra, Yogi (2008). "Berra Quotes," *Things People Said*. Retrieved December 12, 2008, from <http://www.rinkworks.com/said/yogiberra.shtml>.
- Byers, C. and Cannon, H. (2007) "The Programming Game: An Exploratory Collaboration Between Business Simulation and Instructional Design." *Developments in Business Simulation and Experiential Learning*, Volume 34. Reprinted in the *Bernie Keys Library 10th edition*, J. Alexander Smith editor.
- Fayol, Henri (1930). *Industrial and General Administration*, trans. J.A. Coubrough (Geneva: International Management Institute).
- Forrer, Donald A. (2006). *Organizing for Work by Henry Laurence Gantt: Edited with Introduction by Donald A. Forrer*. Self-Published.
- Gantt, Henry Laurence (1916). *Work, Wages, and Profits*, second edition. Engineering Magazine Co., New York
- Gantt, Henry Laurence (1919). *Organizing for work*. Harcourt, Brace, and Howe., New York
- Gilbreth, F. B.(1911). *Motion Study* (New York: Van Nostrand).
- Going, C. B., (1919). Introduction to Second Edition. In H. L. Gantt (Author), *Work, Wages, and Profits* (second edition), (pp. 3-5). New York:NY: The Engineering Magazine Co.
- Kanigel, Robert (1997). *The One Best Way: Frederick Winslow Taylor and the Enigma of Efficiency* (New York: Viking).
- Yermish, I., Boyer, G., et al, (1999). "So you want to run an NFL football Team . . . An Honors Interdisciplinary Project." *Developments in Business Simulations and Experiential Learning*, Volume 26. Reprinted in the *Bernie Keys Library 10th edition*, J. Alexander Smith editor.

Attachment 1

Catalogue Excerpts

Degree Requirements

Each student seeking a baccalaureate degree must complete the appropriate general education requirements, the requirements of a major, and a minimum of 120 credit hours. All students entering the College with fewer than 24 hours of college credit must complete a minimum of 120 credit hours, plus the Introduction to College Life and Liberal Arts Tradition (PC 101-1 credit hour). A student may choose to complete a minor as part of the 120 required hours.

The general education requirements vary slightly for the Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Science, and Bachelor of Science in Nursing degrees. The general education requirements for the Bachelor of Arts, Bachelor of Fine Arts, and Bachelor of Science degrees are listed below.

A. General Education Requirements for Bachelor of Arts

- I. Communication 12-13 hours**
- a. ENG 101 and 102 (minimum grade of “C” required)
 - b. MCOM 100 or BA 200 (required of business majors)
 - c. TM/MATH 100
 or TM 200 for business majors, MATH/TM majors and students interested in TM electives
 or EDUC 250 for education majors (minimum grade of “C” required)
 - d. PC 101 (Not required of transfer students entering the College with 24+ credit hours.)
- II. Humanities and Fine Arts 15 hours**
- a. Foreign Language Sequence (choose pair)
 SPA 101 and 102 (Required for education majors unless a foreign language sequence is transferred.)
 GER 101 and 102
 JAPN 101 and 102
 FRE 101 and 102
 - b. Religion or Philosophy (one course)
 - c. Literature (one English literature [200 level] course)
 - d. Fine Arts (one course from ART 100, 301, 302, MUS 100, 201, 238, THE 100, 301, 302)
- III. Social Sciences 9 hours**
- a. Any two HIST 100-200 level courses
 - b. Any course at 100-200 level from ANT, ECON, PS, PSY, SOC (ECON 121 is required for business majors; PSY 240 is required with minimum grade of “C” for ECE majors)
- IV. Mathematics and Natural Sciences 14-18 hours**
- a. MATH 210 or 225 (minimum grade of “C” required, MATH 210 required for business majors)
 - b. MATH 215 (ECE majors only)
 - c. Any two 100-200 level lab science courses or BIO 110
 - d. Any other science or math course 102 or above except MATH 215. (MATH 110 or 211 for Business Majors)
- TOTAL..... 50-55 hours**

Attachment 2a Advisement Spreadsheet

Student:						Advisor: Taylor, E.C.						11-12	
Section I -- General Education						Section II -- Business Core							
		Norm	ACTUAL			Hrs Still			Norm	ACTUAL			Hrs Still
		Hrs.	Term	Grade	Hours	Required			Hrs.	Term	Grade	Hours	Required
Cat 1 - Communications (12-13 hours)						ACC201	3						3
ENG101 (>D)	3					3	ACC202	3					3
ENG102 (>D)	3					3	BA301	3					3
BA200	3					3	BA314	3					3
TM200	3					3	BA320	3					3
PC101 (trnfr < 24 hr)	1					1	ECON321	3					3
Cat 2 - Humanities & Fine Arts (15 hours)						BA340	3						3
Foreign Language 101	3					3	BA350	3					3
Foreign Language 102	3					3	BA370	3					3
Religion or Philosophy	3					3	BA400	3					3
Eng201/202	3					3	TM401	3					3
Fine Arts (select one)	3					3	BA440	3					3
Cat 3 - Social Sciences (9 hours)						TOTAL	36				0		36
Hist (100-200)*	3					3	Section III - Conc:						
Hist (100-200)	3					3			Norm	ACTUAL			Hrs Still
ECON21	3					3			Hrs.	Term	Grade	Hours	Required
Cat 4 - Math & Natural Science (14-18 hours)						List courses, from reverse side							0
MATH210 (>D)	3					3		3					3
Lab Science (100-200)*	4					4		3					3
Lab Science (100-200)*	4					4		3					3
MATH110 OR MATH211	3					3		3					3
TOTAL	51				0	51		3					3
								3					3
								3					3
								3					3
								3					3
RECAP								3					3
GenEd	49 - 51				0	51							0
BA Core	36				0	36							0
BA Conc	21				0	21							0
SUBTOTAL	106 - 108				0	108	TOTAL	21				0	21
General Electives					0	13	Section IV -- Electives						
TOTAL					0	121			Norm	ACTUAL			Hrs Still
Hours required to graduate					121				Hrs.	Term	Grade	Hours	Required
Transfer Hours													
CONTACT													
Rumi Stu #: _____													
SSAN: _____													
Lions EMAIL: _____				Cell: _____									
STREET: _____													
CITY: _____													
HOME PHONE: _____				WORK PHONE: _____									
Notes:													
* Does not have to be a sequence of two related courses.													
** Bio110 (7 hrs) meets the 8 hr lab science requirement													
							TOTAL	13				0	13

Attachment 2b Advisement Spreadsheet - Concentrations

Section III -- Accounting					Section III -- Management				
	Norm	ACTUAL				Norm	ACTUAL		
	Hrs.	Term	Grade	Hours		Hrs.	Term	Grade	Hours
ACC301	3				ACC/BA341	3			
ACC302	3				BA430	3			
ACC310	3				BA432	3			
ACC420	3				BA455	3			
ACC450	3				BA480	3			
ACC460	3					3			
	3					3			
CHOOSE ONE: ACC341, ACC345, ACC470 BA430, BA431, BA499, ECON313					CHOOSE TWO: BA331, BA425, BA431 BA434, BA470, BA499, ECON313				
TOTAL	21			0	TOTAL	21			0
Section III -- Finance					Section III -- Marketing				
	Norm	ACTUAL				Norm	ACTUAL		
	Hrs.	Term	Grade	Hours		Hrs.	Term	Grade	Hours
ACC301	3				BA/PSY325	3			
ACC302	3				BA430	3			
ECON313	3				BA435	3			
ACC/BA341	3				BA455	3			
BA430	3					3			
BA431	3					3			
	3					3			
CHOOSE ONE: MATH330, ACC345, ACC450 BA455, BA470, BA499					CHOOSE THREE: (BA410 or MCOM370), ACC/BA341 BA412, BA425, BA434, BA470, BA499				
TOTAL	21			0	TOTAL	21			0
Section III -- Gen Business Track					Section III - Conc:				
	Norm	ACTUAL				Norm	ACTUAL		
	Hrs.	Term	Grade	Hours		Hrs.	Term	Grade	Hours
ACC/BA341	3				List courses, from reverse side				
BA430	3					3			
BA455	3					3			
	3					3			
	3					3			
CHOOSE TWO: (BA410 or MCOM370), BA431 BA432, BA470, BA480						3			
	3					3			
	3					3			
CHOOSE TWO: BA325, BA331, BA425, BA499, ECON313									
TOTAL	21			0	TOTAL	21			0

Attachment 3 Gantt Chart

