

# On Line Microsoft Project Tutorial for Engineering and Technology Students

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## Abstract

This paper explores a designed online instructional tool to tutor engineering and technology students on how to utilize the Microsoft Project software to create a project plan which is one of the important elements in project management. Students in the engineering programs and in the technology program at Ohio Northern University are required to utilize Microsoft Project to construct a plan for their senior design projects. There are no any dedicated lectures to teach students or to show them how to use this software. Students need to learn it on their own. The tutorial shows students all the involved steps in project planning and how to insert each task to develop the plan. This tutorial allows students to learn on their own and it is advantageous due to its self-paced. The information and data collected from survey and questionnaires was analyzed and used for the evaluation of the effectiveness of this media based instructional tool. Students have responded favorably to and expressed their satisfaction with the developed tool.

## Introduction

A general call for educational reform has been increasing over the last decade. This has put a demand on educators to find ways to optimize the content of their courses. The continuous growth of technology made it easier for educators to achieve this optimization while meeting the instructional needs of students.

Meeting the instructional needs of students to learn the material is the keystone of every effective program. The tools of educational technology and software hold tremendous potential for improving both teaching and learning processes. Papers [1-6] reported that those who integrate technology in the learning process believe it will improve learning and better prepare students to effectively participate in the 21<sup>st</sup> century workplace. Today, educators are concerned with how to use technology to enhance and enrich their learning environments rather than asking whether to use it.

One of the educational technology elements is Multimedia. Multimedia which is defined in paper [7] as “the integration of video, audio, graphics and data within a single computer workstation” and according to Willis [8] multimedia enables the instructor to custom design and individualize instruction and learner to “plan, execute, and manage” his or her learning experience at the rate, place, and time of the learner’s choice. Folkestad and De Miranda [9] have used multimedia through screen-capture to teach students how to use CAD software. They reported that students were unsatisfied with this instructional tool due to its fast pace and the need to switch back and forth from the recorded lecture to the CAD software.

In this paper, a new instructional tool is presented and the problems encountered in reference [9] are solved by having a variable pace (slow, medium, fast) which allows the students to proceed at their desired pace. The files in this instructional tool have a different format and extensions that overcome the second problem in [9] and students can see both windows (screen captured window and the software window) simultaneously, eliminating the need to switch back and forth. This paper is organized through sections. The first section describes project planning. The second section shows the layout of the developed tool. The data collection and assessment method is described in the third section. This is followed by the results of the assessment and finally the conclusion.

## **I. Project Planning**

A project is a single job that can be accomplished within a given time frame and within a certain budget. It actually gets done based on the project plan. The project plan outlines the various needs and reduces them to a set of specifications. It also helps to identify and schedule the various tasks. Each task has a duration, which is how long it takes to complete the task.

The Gantt chart, named for Henry Gantt, a pioneer of project management techniques, provides a graphical visualization of the project that displays each task as a horizontal bar. The length of the bar corresponds to the duration of the task. The primary purpose of the chart is to graphically display project schedule information by listing project tasks and their corresponding start and finish dates in a calendar format.

## **II. Instructional Tool Layout**

The main page of the developed instructional tool consists of three subtitles. The three subtitles are:

1. Notes  
This section provides students with the necessary topics and information regarding MS Project.
2. Tutorial  
This section provides students with every single step on how to perform a task in constructing the project plan. Students can open a new MS Project file and at the same time can watch the tutorial and imitate the steps without switching windows back and forth. This means that both windows, the MS Project window and the Tutorial window, are active simultaneously. The topics covered in this tutorial are as follow:
  - Add tasks  
This activity shows students how to add a task using MS Project, a screen shot of this activity is shown in Figure 1. A project usually consists of many tasks. Learners can follow this tutorial to add as many tasks as needed. Tasks can be organized with proper durations, starting date and finishing date.

Mon 12/1/03						
	Task Name	Duration	Start	Finish	Predecessors	
1	Team Visit to Nickles	2 days	Mon 12/1/03	Tue 12/2/03		

December, 2003						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

Today: 11/29/2003

Figure 1. A step of adding a task

- **Change Project View**  
In this activity, students are shown how to change a view of a project. Several views are available in MS project so learners can change the view to best fit their need.
- **Printing a View**  
This activity shows students that almost every view of a project can be printed. It points out the printing involves several extra considerations. The most important, students are to make sure that they preview the printout on the screen before they print it.
- **Change Start Date**  
This shows students how to change a start date or modify it in case they get behind in schedule. This is shown in Figure 2. Learners can use the same function to change the duration of a task and the finishing date.

	Task Name	Duration	Start	Finish
1	Brainstorming	4 days	Mon 12/8/03	Thu 12/11/03
2	Basic Layout	11 days	Thu 12/11/03	Thu 12/25/03
3	Build Machines	4 days	Mon 12/15/03	Thu 12/18/03
4	Build Parts	3 days	Mon 12/8/03	Wed 12/10/03
5	Progress Report			Mon 12/8/03
6	Revisit ATI			Mon 12/8/03
7	MileStone - A			Mon 12/8/03
8	Improvement			Fri 12/12/03
9	simulation			Wed 12/10/03
10	New Layout			Wed 12/17/03
11	MileStone - S			Mon 12/8/03
12	Add Conveyor			Tue 12/9/03
13	Progress Report	1 day	Mon 12/8/03	Mon 12/8/03

December, 2003						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

Today: 11/29/2003

Figure 2. A step to change starting date

- Split Tasks

This activity shows students how to use the leveling tool to split a task. This is important because sometimes many tasks are overlapped. For example, suppose there are two tasks to be completed. Task 1 will not be completed unless Task 2 is finished prior to completing Task 1. This is shown in Figure 3.

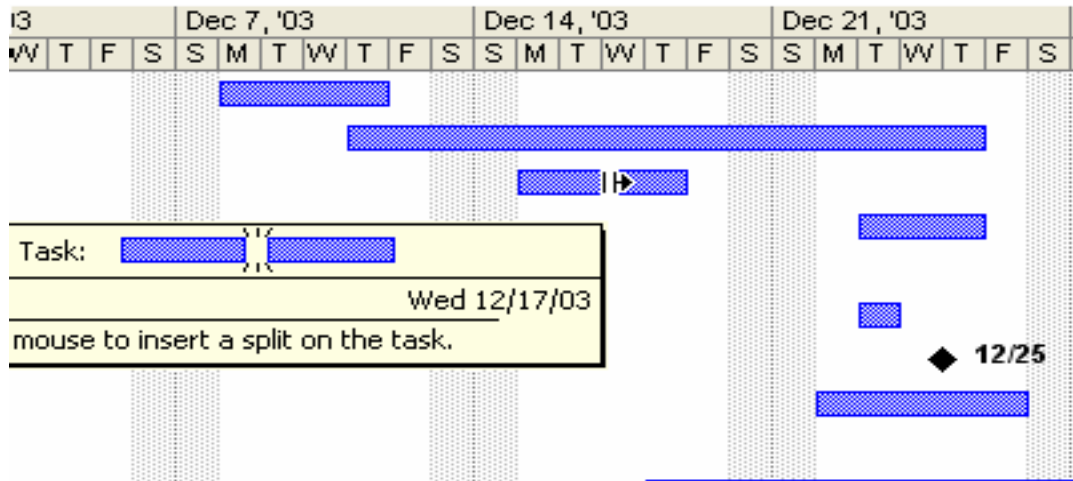


Figure 3. A step of splitting a task

- Link Tasks

This tutorial shows students on how to link tasks together. This is needed when one task depends on another task. This is shown in Figure 4. Learners need to know what tasks build on top of the other tasks.

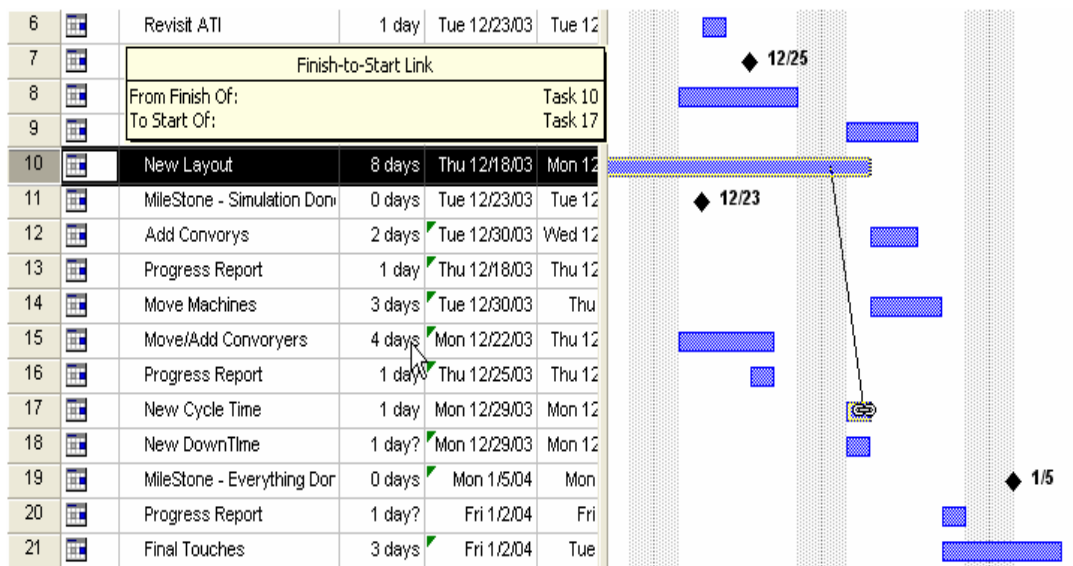


Figure 4. A step of linking a task

- **Add Resources**  
This tutorial shows students how to add resources to the project plan such as parts needed and their numbers, vendors, specifications, etc. This is shown in Figure 5.

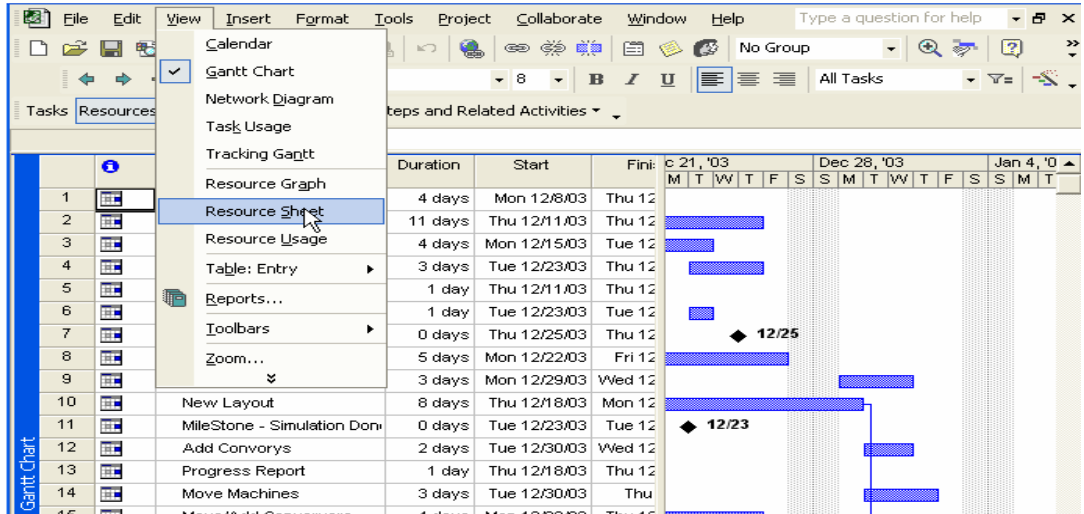


Figure 5. A step of adding resources

- **Assign Resources**  
This step is similar to the previous step, but it includes an additional element that allows users to assign specific members to specific tasks. This is shown in Figure 6.

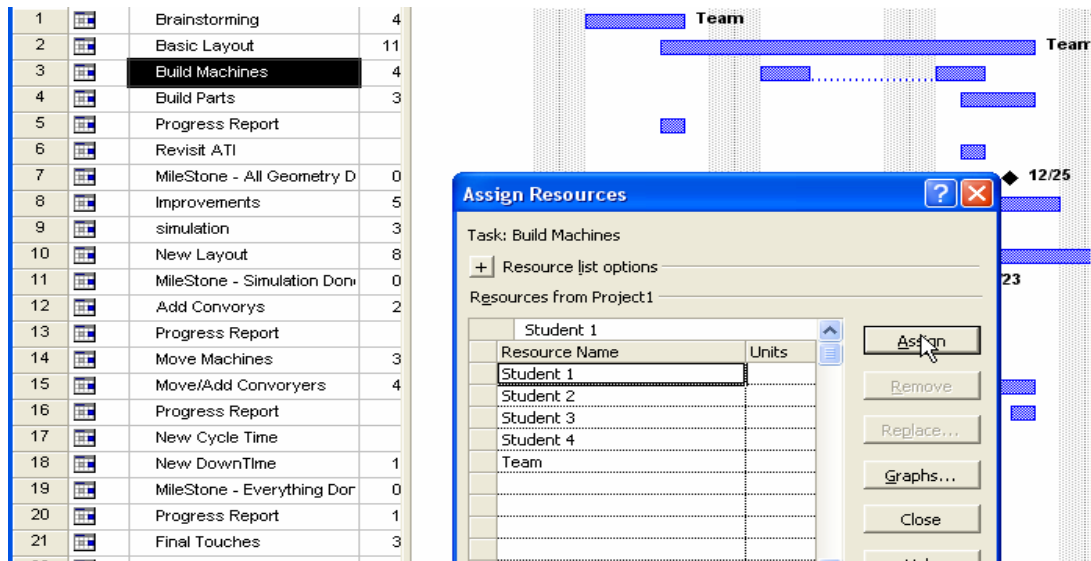


Figure 6. A step of assigning a resource

- **Percent Complete**  
This step shows students the task information and allows them to update the percentage completion of a task. The percent complete will be indicated through a dark color line on the top of the duration horizontal line. Figure 7 represents this activity.

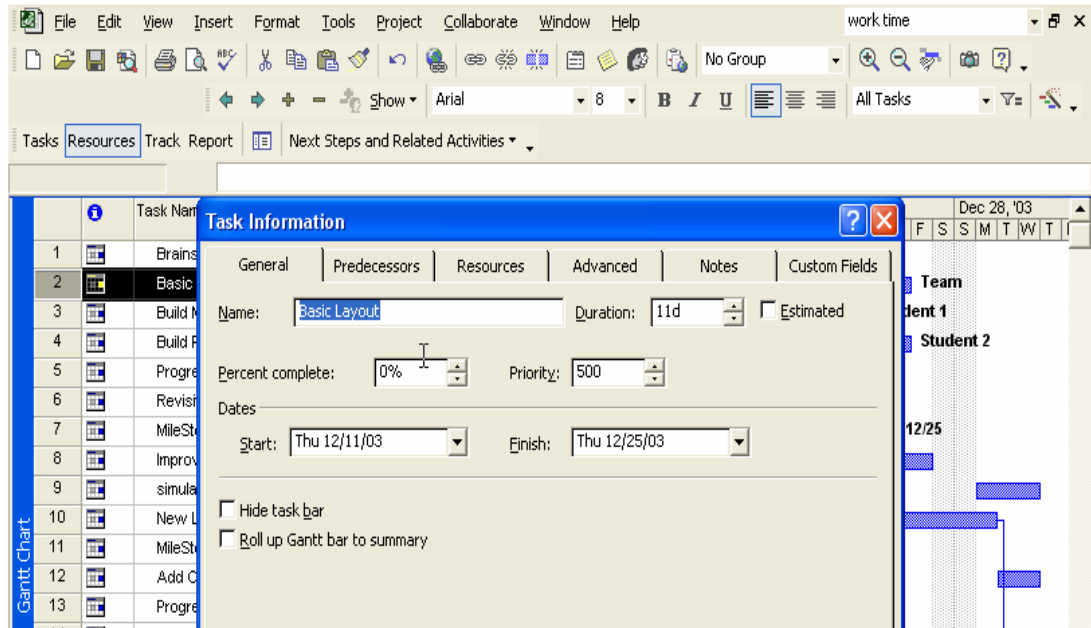


Figure 7. A step of percent complete

### 3. Links

This section is designated for useful links. Students are encouraged to navigate through these links for more information regarding MS Project.

## III. Data Collection and Assessment Method

Students who have used this on line tutorial tool were asked to participate in the assessment process. The tools of the assessment are a survey and a comment section. The following subsections are to describe the participants, the assessment tools and the results of the assessment.

### 1. Participants

The pool included twenty five senior students who are enrolled in the senior design courses at Ohio Northern University. There were 88% male and 12% female. Students have classified themselves regarding computer knowledge based on a score ranges from 1 to 10. There were 60% considered their level of computer knowledge to be 7 or higher and 40% below 7.

### 2. Assessment Tools

To evaluate the effectiveness of this tutorial tool, two assessment tools were used. A survey sheet that consists of ten questions and on the back of the sheet a section for students to

express their experience on using and following the tutorial. The primary assessment goal was to measure the attitude of students toward this instructional tool. The survey sheet is shown in Table 1.

*Table 1 Survey Sheet*

		SD	D	N	A	SA
Q		1	2	3	4	5
1	I consider myself to be excellent in operating computer applications					
2	I never used MS Project previously					
2	I enjoy learning using media-based instruction					
3	I believe it is important for me to know how to use MS Project					
4	I concentrate better when a media-based instruction is used					
5	I feel comfortable learning on my own time					
6	Using media-based instruction improved my engagement in the learning process					
7	The tutorial motivated me to do more project planning					
8	The tutorial steps are very clear and easy to follow					
9	I believe it is easier to follow this tutorial compared to following a book					
10	I encourage other students to use the tutorial					

Students were asked to indicate their level of agreement on each statement of the survey using a five-point Likert scale with higher values indicating greater levels of agreement with the statement. The scale is defined as 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree and 5 for strongly agree. This methodology is often used to ensure that participants make at least some commitment toward attitude.

- ***Statistical Results***

The data obtained from the survey indicates the satisfaction of students toward this tutorial tool. The results for each question in the survey were recorded as shown in Table 2. From the table, majority of students liked the developed tutorial tool.

*Table 2. Survey Results*

		SD	D	N	A	SA
Q		1	2	3	4	5
1	I consider myself to be excellent in operating computer applications	0	0	3	4	18
2	I never used MS Project previously	0	0	0	0	25
2	I enjoy learning using media-based instruction	0	1	7	5	12
3	I believe it is important for me to know how to use MS Project	0	0	2	15	8
4	I concentrate better when a media-based instruction is used	0	2	7	9	7
5	I feel comfortable learning on my own time	1	3	0	10	11
6	Using media-based instruction improved my engagement in the learning process	1	2	4	8	10
7	The tutorial motivated me to do more project planning	1	2	5	9	8
8	The tutorial steps are very clear and easy to follow	0	0	0	11	14
9	I believe it is easier to follow this tutorial compared to following a book	0	0	2	9	14
10	I encourage other students to use the tutorial	0	1	0	14	10

- ***Students Comments***

On the back of the survey sheet, students were asked to write comments regarding this media based tutorial tool. The comments of students included the following:

- This tutorial is so helpful.
- I like watching the steps and follow them at the same time.
- This is good, but it will be better if there is an associated audio.
- I like the fact that it shows a step by step procedure of how to construct a Gantt Chart.
- I think learning MS Project through this tutorial is so easy.
- It is great to learn by doing.
- This tutorial is less confusing than trying to read through the manuals and learn how to create a project plan.

Based on the statistical data and the comments obtained from students, the on line tutorial tool is proven to be an effective learning tool that has worked for majority of students. Students were satisfied with the instruction, and the access to the tool.

## **Conclusion**

The on line tutorial tool was designed to tutor students how to use MS Project software to construct a project plan. The purpose of this paper was to represent some of the involved steps in the software and to evaluate the attitudes of students toward that on line integrated tutorial tool. The information and data collected from the survey was analyzed and used for the assessment and evaluation. Students have responded favorably to and expressed their satisfaction in the developed instructional tool. We believe that the on line tutorial tool offers some advantages such as it is a completely learner-paced, it can be followed easily, it does not require a great deal of time or effort and the learner does not have to be at a specific time and place to use it. Finally, since the role of instruction is not to distribute facts but to grant students with ways to assemble knowledge, educators must find favored strategies that build students' confidence and enhanced course relevance. This can be achieved through the continual investigation of appropriate ways to introduce new technologies into the classroom.



## Bibliography

- [1] S. M. Butzin, "Using instructional technology in transformed learning environments: An evaluation of project child," *Journal of Research in Computing Education*, 33(4), pp 367-384, 2000.
- [2] M. H. Hopson, R. L. Simms & G. A. Knezek, "Using a technologically enriched environment to improve higher-order thinking skills," *Journal of Research on Technology in Education*, 34(2), pp 109-119, 2002.
- [3] S. T. Marina, "Facing the challenges, getting the right way with distance learning," *Ed at a Distance*, 15(30), pp 1-8, 2001.
- [4] R. A. Reiser, "A history of instructional design and technology: Part1: A history of instructional media," *Educational Technology Research and Development*, 49(1), pp 53-64, 2001.
- [5] K. Njagi, R. Smith & C. Isbell, "Assessing Students' Attitude Toward Web-based Learning Resources," <http://naweb.unb.ca/proceedings/2003/PosterNjagiIsbell.html>, 2003.
- [6] F. Jao and K. Al-Olimat, "An Investigation of the Attitude of Learners toward Media Based Instructions of PSPICE in Electric Circuits Analysis," *Proceedings of ASEE Annual Meeting and Exposition*, Salt Lake City, UT, June 2004.
- [7] A. W. Bates, R. Harrington, D. Gilmore & C van Soest, "Compressed video and video-conferencing in open and distance learning: A guide to current developments," *The Open Learning Agency*, Burnaby, B.C., pp 6, 1992.
- [8] B. Willis, *Distance Education Strategies And Tools*, Educational Technology Publications, Inc., pp 169, 1994.
- [9] J. E. Folkestad & M. A. De Miranda, "Impact of Screen-Capture Based Instruction on Student Comprehension of Computer Aided Design (CAD) Software Principles," *Journal of Industrial Technology*, 18(1), pp 1-5, Novemebr 2001 to January 2002.
- [10] R. B. Bunin, *Microsoft Project 2002*, Thomson Learning, Boston, 2003.

## Author Biographies

**Dr. Feng Jao** obtained her PhD from the University of Toledo in the field of Educational Technology in 2001. Currently she is an assistant professor in the Department of Technological Studies at Ohio Northern University. Her professional interests include integration of instructional technology across curriculum, software training, digital media, and web-based instructional material design and development. Dr. Jao holds several certifications including Microsoft Office XP Word 2002 Expert, Office XP Excel 2002 Expert, Office XP PowerPoint 2002 Comprehensive, Office XP Access 2002 Core, Office XP Outlook 2002 Core and WebCT. She is an active member in AECT and ITEA professional organizations. Dr. Jao is listed in the International Who's Who of Professional Management.

**Dr. Khalid S. Al-Olimat** is an associate professor in the Department of Electrical & Computer Engineering and Computer Science at Ohio Northern University. He obtained his BS in Electrical Engineering from Far Eastern University on 1990, the MS in Manufacturing Engineering from Bradley University on 1994 and his PhD in Electrical Engineering from the University of Toledo on 1999. Dr. Al-Olimat has many publications in the area of adaptive control, fuzzy control, machine drives and engineering education. His areas of interest are power engineering, adaptive, fuzzy and intelligent control. He is a member of ASEE and IEEE where he is serving as the Vice-Chair of IEEE-Lima section.