Instructional Design Project

Excel Pivot Table Lesson

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Table of Contents

Synthesis Reflection Paper 4
Part 1. Topic 5
1a. Goal statement 5
1b. Audience description 5
1c. Rationale 5
Part 2. Analysis Report 6
2a1: Needs assessment survey 6
2a2: Needs assessment data 6
2b1: Learning context description 8
2b2: Transfer context description 9
2c: Description of Learners 9
2d: Task Analysis Flow Chart 11
Part 3. Planning 13
3a: List of instructional objectives 13
3b: Objectives matrix table 13
3c: ARCS Table 14
Part 4. Instructor Guide 16
Introduction 16
Body 16
Conclusion 17
Conduct Assessment 17
Part 5. Learner Content 18
5a: Learning materials 18
5b: Assessment materials 22
5c: Technology tool rationale 23
Part 6: Formative Evaluation Plan 23
6a: Expert Review Plan 23
6b: One-to-One Evaluation 24
6c: Small Group Evaluation 24
6d: Field Trial 25
Part 7. Formative Evaluation Report 25

7a: Evaluation survey 25
7b: Report of expert review 26
7c: Designer's response to review 26
Part 8. Standards Grid 27
Professional Standards Addressed (AECT) 27
References 33

Synthesis Reflection Paper

I have discovered Instructional Design (ID) is more than simply planning out and putting together learning materials. At first, I was surprised at how involved the design process really is. I knew the process was important, but I had no idea of the level of detail required for a well-designed lesson. In the past, I just "knew" what to do and created the material for the lesson. Now, I "know" better. I am also grateful to my peers for reviewing my work and providing helpful feedback. ID is like building a house. You have to have a strong and expansive foundation in place before you begin erecting the framework of the walls, the trusses, and other structural components. There must also be a plan laying out the order in which the parts are assembled.

I had designed lessons and courses before, but I used pre-developed procedures that allowed me to do course design at an accelerated rate. This course has made me appreciate the effort in developing those procedures. It is important to truly understand the learning goals and the desired outcomes before you begin developing learning materials. I also appreciate the personalized approach needed to address different learning styles. One must understand the learners before they can create curriculum. Establishing a need for instruction sounds obvious, but in reality, there is much more to discovering that need than simply making the decision to proceed. Knowing who the stakeholders are and the purpose of the instruction is paramount.

I learned about who instructional designers are and what important knowledge they must have to be successful. As I worked through each step of this project, I started to realize I may want to continue on an instructional design track. I spent many years in business and I have always enjoyed project management. Instructional design is no different than any of the project management models I have encountered. There is usually an analysis, a design, a development, an implementation, and an evaluation phase in any well designed project. Each phase in the instructional design process is interdependent. Each phase should also be conducted in order. Skipping a step may lead to time-consuming mistakes. I also learned the framework of instructional design relies on more than just cookie cutter processes. Building a house doesn't just require knowledge about construction, but also about wiring, plumbing, painting, and other specialized skills. The same can be said for instructional design. It relies on communication, systems, learning, developmental, and instructional theories (Smith and Ragan, 2005, p.33).

This project is just one of many opportunities for me to hone my new skills learned in this class. Going forward, I plan to apply this knowledge to my professional career as an educator. In fact there is a strong possibility I may become a designer, or a distance education specialist, or an academic project manager. All of these positions are appealing to me. In the meantime, I plan to incorporate what I have learned into my online classrooms. This course has taught me how to look at my own lessons more objectively. I have already started the process of redesigning many of the lessons in my courses. Eventually, I will take on the task of restructuring the courses themselves in an effort to capture the attention and sustain the interests of my students. I may have to wait until I am finished with the MIT program though. There is no doubt I still have much more to learn and if I make changes too early I will find myself in a continuous redevelopment phase.

Reference: Smith, P. L. & Ragan, T. J. (2005). Instructional *Design: Third Edition.* Hoboken, NJ: John Wiley & Sons, Inc.

Part 1. Topic

1a. Goal statement

Given a set of data, learners will synthesize the data using the pivot table function in Excel and present the results in a chart.

1b. Audience description

The learners are second year community college students predominantly comprised of students on track to earn an associate degree in business or paralegal studies who are enrolled in a Computers in Business online course. The course focuses on intermediate skills in the use and integration of the Microsoft Office application software.

1c. Rationale

Many businesses and legal organizations maintain records and process large amounts of data. Microsoft Excel is a popular software application used to manage these records and data. Most employers express great value in having their employees proficient in the use of this software.

The Computers in Business course addresses the needs of local businesses and legal organizations by preparing students for employment. It also satisfies the degree requirements of graduating business and paralegal students.

The creation and use of pivot tables is one of the more useful tools in managing data and presenting information with Excel. Pivot tables allow for easy isolation and querying of extensive amounts of data. Users are able to geographically switch the placement of rows and columns of data into more discernable categories and subcategories. From those categories, users can create useful reports or identify trends and patterns from the creation of customized charts.

The overall instruction strategy is approximately 90% supplantive even though the students are typically generative. Online learners are normally highly motivated and are comfortable with technology. These particular learners have ample prior computer knowledge before enrolling in the course and they are generally in charge of their own learning. Online instructors are normally more of a facilitator of knowledge rather than a giver of knowledge.

The course subject matter is broken down into manageable tasks and is specific to the skills needed for employment. A certain level of mastery is required and the goals are pretty uniform. This course will utilize procedural instructional strategies because the goal of the instruction is to teach the learner the procedures involved in creating a pivot table, synthesize it, and present the results in a chart.

Part 2. Analysis Report

2a1: Needs assessment survey

Before a student can take this course, they must meet certain requirements. Those requirements include being a second-year student with substantial business and computer knowledge. They must also have a computer or have access to one. However, if there were qualifying questions to be asked about the lesson, the following would be considered:

- What is your comfort level with an online class?
- What activities do you feel you learn best in an online course?
- Why did you take the course online rather than face-to-face?
- How comfortable are you using Microsoft Excel?
- What is your understanding of what a pivot table does and is used for?
- Have you used a pivot table before?
- What is your comfort level with using pivot tables?
- How much experience do you have using computers and Microsoft Office applications?
- What motivated you to take the course, to learn Excel, and to use pivot tables?
- What do you hope to gain by learning this lesson?
- How soon before you will apply this skill?

Basic questions would be:

- Do you have a computer with the appropriate input and output devices?
- Does the computer have the required software and connection to the internet?

I am not allowed to ask students about disabilities unless they disclose the disability to me or the Disability Services.

The course itself is required for students hoping to graduate with a business, management, or paralegal degree. This is required by articulation agreements with other colleges in the state. A business advisory committee and a paralegal advisory committee made up of local professionals also advised the course should be in the curriculum.

2a2: Needs assessment data

The lesson on pivot tables fits the course outcomes and meets the needs of students. Instead of a needs assessment survey, supportive information was gathered from a forum. Students participated in a form that required they watch a stock screencast video about pivot tables. The students were encouraged to discuss the video and whether they might use this skill. The students expressed a great deal of interest in the lesson. They felt this skill would be valuable and very useful. A couple students felt a step-by-step assignment would be very interesting and beneficial.

The forum posts (written verbatim from students) are as follows:

1. I would use these in a presentation of a company; it would be great in monthly, quarterly, yearly reports to keep the some uniform reports.
2. The pivot table seems like a great tool. As an accounting student, I find this to be valuable.
3. The pivot table gives the user the ability to look at the same data in different ways, something I think limits Access, because once entered in Access, it's difficult to change (at least for me it was). The pivot table would be useful when you need to present a portion or another view of relevant information. For example: in Unit D, we created a worksheet in Excel displaying revenue and expenses. The pivot table would allow the user to select the fields that would be pertinent to the presentation.
4. They pivot tables would have been an interesting assignment, and I think they would be very useful for the compilation and compare of data - especially in companies that have many offices and branches.
5. I agree, these probably would have been interesting assignments to do. I am very glad that we have the whole week to work on our projects though, and we could always do one of the assignments out of the book just to get a more hands-on feel for these features. I might do that when I have a little more free time, I actually enjoyed doing the step-by-step projects. Have a good summer!
6. I agree that the video's were a little difficult to understand as well, but it definitely easier to do it rather than to watch a video on how to do it. the impression that I got is that a pivot table is quite similar to a query. It would have been easier to learn in a step by step assignment.
7. Implementing the use of a pivot table would definitely be valuable when working with a large amount of data. It looks as if it expedites the entire process by focusing on just one field, if that's what your intentions are. And like the video stated, it will definitely assist you in recognizing the trends of the data. Personally, this would be ideal for yearly sales report.
8. You would use a pivot table if you had a really large amount of data and you needed to rearrange the information in order to see it in a different order. Pivot tables can also help if you want to compare certain categories of information to others without having to scroll through all of the information to find it. I would definitely find a use for this at my job.
9. I would use a pivot table to analyze a large volume of legal cases. This would be a great tool for seeing what types of cases are won/lost the most/least, in what states, by male or female attorneys, etc.
10. After watching the video on pivot tables, I think that this type of table would be good for a large corporation that has offices in many cities and states. It would allow them to keep track of all financial and other relevant data for each branch office and be able to

compare them with the same data from other branch offices. Pivot tables would also be useful for preparing any type of financial reports, especially end of the year reports. I would rather have done an assignment on pivot tables than the lookup table. It looked harder.

11. I've never used a pivot table before but it looks like it would simplify finding complicated information and putting it into a table. I could use this for my grandmothers store to show her the inventory she's sold and the revenue from it.
12. I would use the pivot table to easily run reports on the different clients we have in the law firm I work for. We practice criminal, juvenile and federal law. We also have cases that are assigned to us through the state and retained cases. This would be very useful to be able to run a report for all the different categories of cases we handle.
13. Pivot Tables-Wow, this will help so much when creating inventory. I also like that if you own multiple businesses this tool will help to combine info from all the locations. This is really neat and is another tool that would have been nice to learn more about. I am excited to try it.

2b1: Learning context description

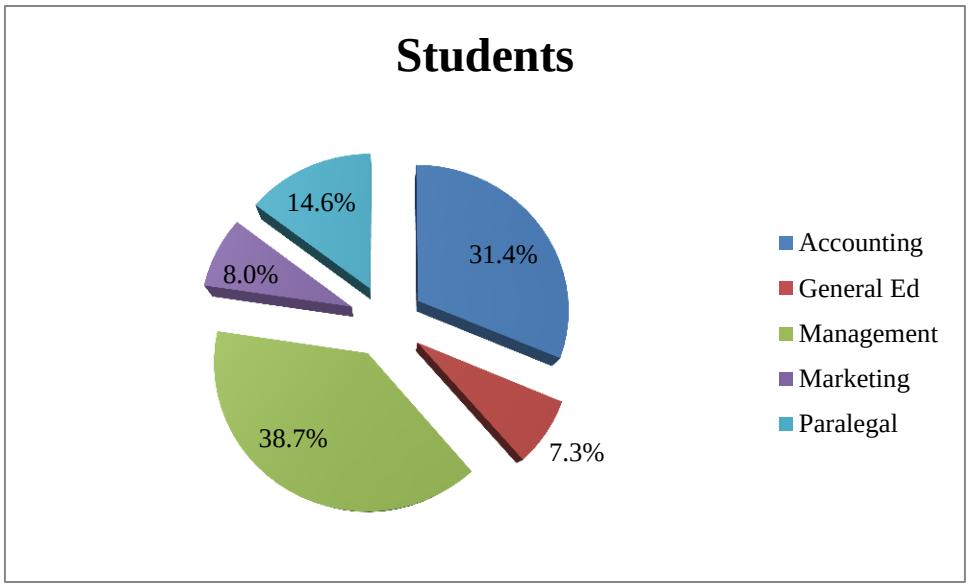
The teacher is very committed and dedicated to the learners. The teacher is open to all forms of instruction, especially online education. The teacher is enthusiastic about the subject matter and the lesson. This lesson curriculum is a "learn by doing" practicum and it fits with the teacher's teaching style. There will be step-by-step instructions, screen capture examples, and a screencast tutorial.

The learners are required to have access to a suitable computer and a high-speed internet connection. Students are also required to have the Microsoft Windows version of the Microsoft Office Professional application software installed on their computer. The MAC version does not have the capabilities required for the course. The 2010 version of the application software is preferred, but the 2007 version will suffice. On campus computer labs are available with suitable computers and software if students do not have personal access to the required hardware and software.

This lesson is offered in an online course using Angel course management software. The course is four credit hours and is presented in ten week terms. It is offered in the fall and in the spring. There is also a face-to-face version of the course offered only in the fall. The spring course was added due to increasing demand from the paralegal program. There was a large push to make the paralegal program completely online and that was a major contributor to the creation of the online course.

The learners are required to take the course in order to fulfill their degree requirements. The majority of the students are attending college to obtain job skills or improve their education to assist them when seeking employment. Just over 2% of the students are transferring to a four-year college or university. There were 141 students enrolled in the course over the last two years.

Seventy eight percent of the students are business majors while fifteen percent are paralegal studies as shown in the following chart.



The learners are genuinely interested in learning the skills presented in the course. Therefore, they tend to be highly motivated and diligent when completing lessons such as this one. This is also the only course the college has offering intermediate to advanced skills using Microsoft Office. Because of this, enrollment is competitive and attrition is low. The enrollment cap is 24 students per class. However, instructors often waive that cap to accommodate one or two more students.

2b2: Transfer context description

Students taking this course will be able to apply the skills learned in most office settings. Employers actively looking for employees to manage strategic roles such as that of an analyst, a data management specialist, or a records keeping position will find these skills useful. Learners will benefit from this lesson as it will save them time and frustration when dealing with large amounts of data. It will expand research and reporting efforts and instill confidence in the learner's ability to be effective with Office software.

2c: Description of Learners

The learners are men and women typically between the ages of 18 and 65. These learners are in their second year of college and have already had at least one college level online course. The learners will have a varied level of experience and background in the areas of business and computers.

Any learner with special needs have declared accommodation requirements with the college's Disabilities Services Department. This course does not have exams, so no additional time requirements or proctoring is needed. Hearing impaired learners will be able to rely on the lesson's written material when watching videos. The course material and the learning management software are ADA compliant so students with visual impairments are accommodated.

This course has a prerequisite the students are second-year students and assumes they have acquired the following Microsoft Excel skills through previous courses or experience.

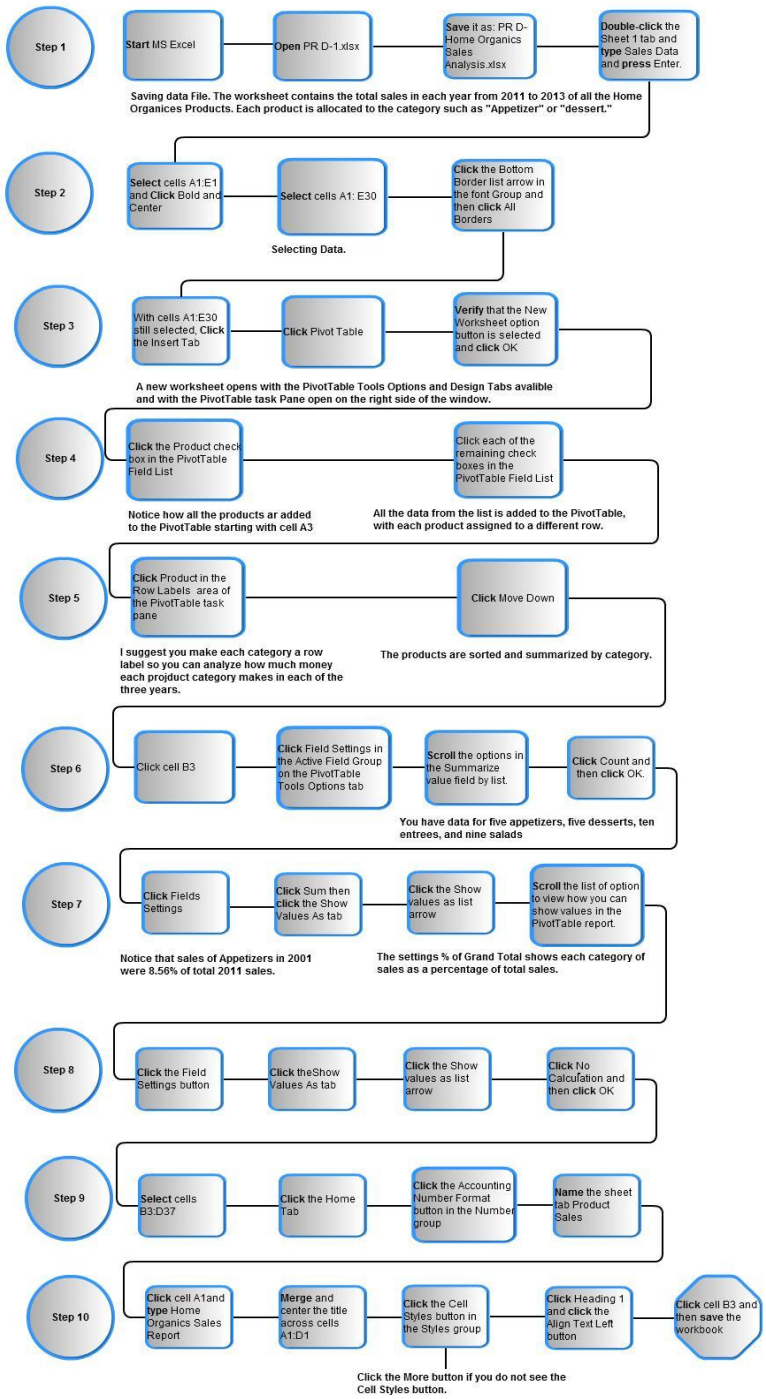
Since this lesson builds on prior knowledge the learner should already know how to do:

- Insert and delete rows and columns
- Adjust column width and row height
- Use the Draw Table and Eraser tools to create and edit a table grid
- Format text alignment and direction within a table cell
- Format borders and shading and apply table styles
- Sort data in a table
- Convert text to a table and vice versa
- Format text in columns
- Add borders and shading to enhance the appearance of your documents
- Create a new workbook
- Identify the parts of the Excel screen
- Navigate through a worksheet and a workbook
- Change views and magnification in the worksheet window
- Enter data in a spreadsheet
- Insert and delete rows and change column width and row height
- Copy, clear, move, and delete data
- Use the Undo and Redo features
- Use the AutoFill feature to copy and enter data into a range of cells
- Create, rename, and delete worksheets
- Merge cells and format cell contents
- Add borders and shading to worksheet cells and apply built-in cell styles and table Quick Styles
- Sort and filter data in a worksheet
- Change the page setup of a worksheet and add headers and footers
- Customize the print options
- Understand and create formulas in a worksheet
- Understand and use relative and absolute cell references
- Understand and use function formulas
- Connect worksheets by using formulas with cell references to multiple worksheets
- Identify and correct formula errors
- Create a chart from worksheet data
- Edit chart data and change chart formats and options
- Interpret data from worksheets and charts

2d: Task Analysis Flow Chart

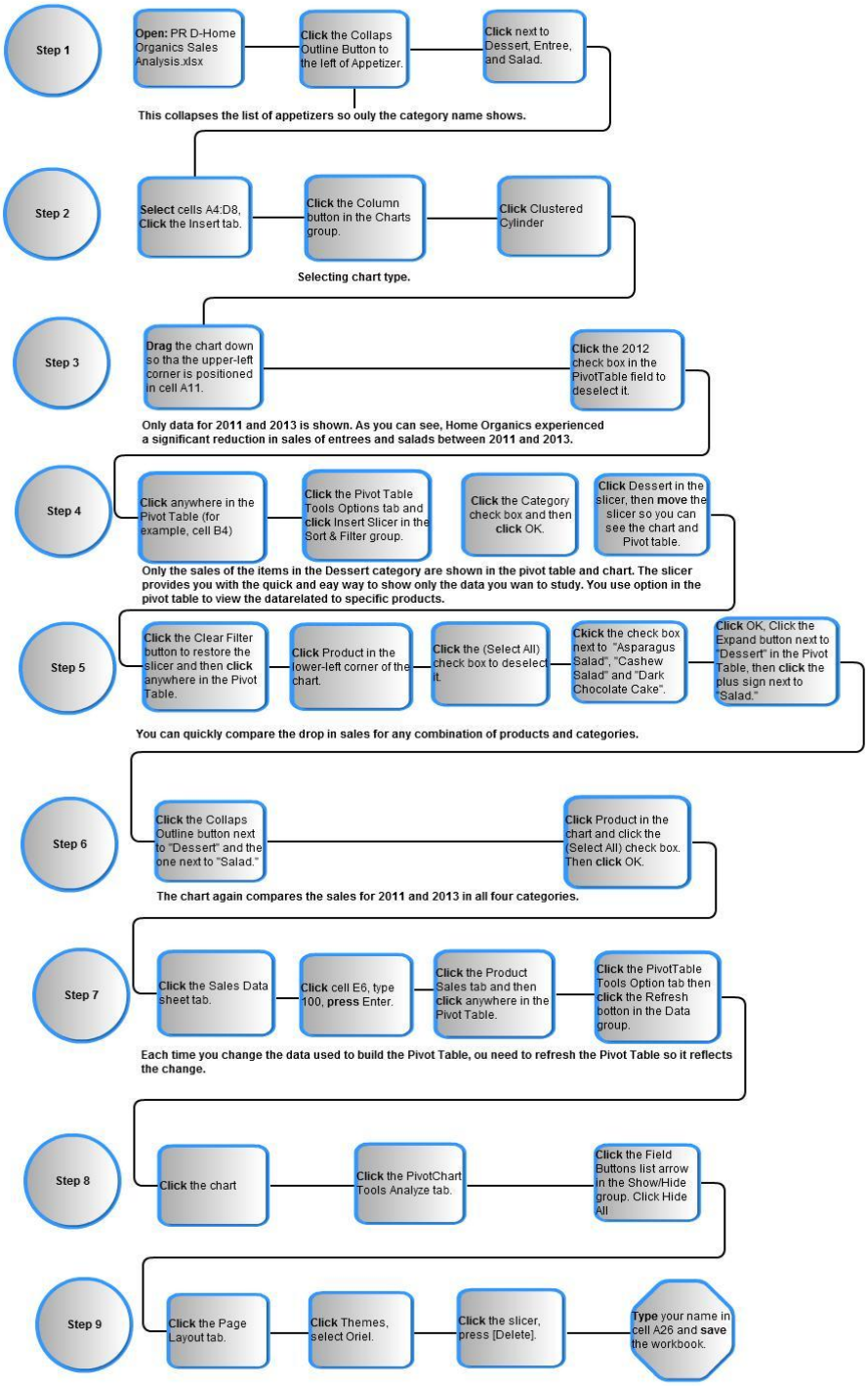
Task Detail Part 1

Learners open a product list, then use the PivotTable function to create a pivot table that shows yearly sales of each product category ("Appetizer," Entrée," ext.) sold by Home Organics.



Task Detail Part 2

Learners create a chart to present the data in the pivot table and then use the slicer to filter data.



Part 3. Planning

3a: List of instructional objectives

1. Given a list of Excel Data, the learner can create a pivot table to summarize data.
2. Learners can select data in a pivot table.
3. Learners can consolidate multiple data ranges.
4. Learners can filter and sort data using a slicer in a pivot table.
5. Learners can use totals and sub-totals in a pivot table.
6. Learners can format data in a pivot table.
7. Learners can collapse and expand category lists using a pivot table
8. Give the information in a pivot table, the learner can create charts to present data.
9. Given sales data expressed in a Chart, learners can analyze variances and spot trends.
10. Learners can apply themes to an Excel worksheet.
11. Learners can describe when to use a pivot table and why.

3b: Objectives matrix table

Learning Objectives	**Blooms Taxonomy Class**	**Format of Assessment**	**Description of Test**	**Sample Items.**
1	Application	Performance	Completion of task	Given a list of Excel Data, the learner can create a pivot table to summarize data
2	Application	Performance	Complete	Select data in a pivot table.
3	Application	Performance	Complete	Consolidate multiple data ranges
4	Application	Performance	Complete	Filter and sort data using a slicer in a pivot table
5	Application	Performance	Complete	Use totals and sub-totals in a pivot table
6	Application	Performance	Complete	Format data in a pivot table
7	Application	Performance	Complete	Collapse and expand category Lists using a

				pivot table
8	Application	Performance	Completion	Create charts to present data
9	Analysis	Paper and Pencil	Compare/Contrast	Analyze variances and spot trends
10	Application	Performance	Complete	Apply themes to an Excel worksheet
11	Comprehension	Paper and Pencil	Discuss	Describe when to use a pivot table and why

3c: ARCS Table
Project Goal Statement: Given a set of data, learners will synthesize the data using a pivot table function in Excel and present the results in a chart.

ATTENTION
A.1 Perceptual Arousal
• Ask students if they have ever encountered an enormous amount of data and wished they had an easy way to summarize it. This would be a good place for some humor. • The students could be shown a spreadsheet with thousands of records such as a corporate phone bill and then shown what a pivot tables produces within seconds.
A2. Inquiry Arousal
• Ask the students if they have an example of a current Excel data source they would like to eliminate.
A3. Variability
• Present a screencast of how easy it is to create a report from a pivot table.

RELEVANCE
R1. Goal orientation
• Students will be told they will be creating a simple pivot table to produce a common sales report.
R2. Motive matching
• Feedback from other students can be presented to show a common interest among peers.
R3. Familiarity

- Relate the lesson to previous lessons they have already completed.

CONFIDENCE

C1. Learning requirements

- Inform students that they can follow a step-by-step video presentation of the lesson.
- Inform students the instructor is available to answer questions.

C2. Success opportunities

- The instruction will be broken down into two parts and have screen shots available to check student progress.
- A final screen shot will be available for students to compare their work to.

C3. Personal control

- Students will have opportunities throughout the lesson to experiment with the software tools.

SATISFACTION

S1. Natural consequences

- Students will complete a final group project where they can apply the skills learned in the lesson.

S2. Positive consequences

- The instructor will provide constructive feedback within 48 hours of the due date.

S3. Equity

- Students will receive a grade for their work within 48 hours of the due date.

Part 4. Instructor Guide

Introduction

Instructor Preparation:

1. Confirm the data file is available to students. The students retrieve the data files from the data file link in the Angel leaning management software. The file is named PR D-1.

2. Confirm the screencast videos links work and are visible in the course weekly folder.

3. Confirm the instructions and screen shots are visible in the course weekly folder.

4. Confirm the lesson scenario and instructions are visible in the course weekly folder.

Gain the Attention of the Students

Ask students if they have ever encountered an enormous amount of data and wished they had an easy way to summarize and present it. Make a statement about having the ability to use a cool concept such as "pivot table" in order to manage a spreadsheet with thousands of records.

Establish Lesson Purpose

Inform students of how valuable this skill is and how useful it will be going forward.

Arouse Interest and Motivation

Tell a story: Use an example of something practical like a corporate phone bill that is 8 inches thick and say it can only take about 30 seconds to sort and subtotal the whole thing by department.

Provide an Overview

Scenario: As an analyst for Home Organics, you work with a product list already created in Excel to produce a report that analyzes sales over a three-year period. To create the Sales Report, you need to **Create a PivotTable** and **Filer and Chart Results.**

Explain the project is a two-step project:

1. Create a PivotTable: You open a product list, then use the PivotTable function to create a PivotTable that shows yearly sales of each product category ("Appetizer," Entrée," etc.) sold by Home Organics.

2. Filter and Chart Results: You create a chart to present the data in the PivotTable you created in part one and then use the slicer to filter data.

Body

Recall Relevancy

Relate the lesson to the prior lesson to stimulate recall from prior knowledge through the course announcements of the lesson expectations.

Present Information and Examples

Provide information to guide the students to the illustrated lesson instructions, podcast videos, and the data file.

Focus Attention

Focused redirection of attention is built into the lesson. Explanation of each step in the lesson reminds the students of what they did so they can reflect.

Employ Learning Strategies

Refer to screencast videos for guidance and review if the students encounter challenges.

Guided Practice

Make yourself available for questions. Check in with students and remind them you are available to assist.

Evaluate and Provide Feedback

Provide instructions on how to submit their work and when the due date is. Give expectations on when grading and feedback will be completed.

Conclusion

Summarize and Review

After all lessons have been submitted or the submission due date has passed, provide a copy of the solution in the feedback email.

Transfer Learning

Encourage students to try this technique with challenges similar to the lesson at work or on other projects.

Provide Remediation and Closure

Discuss common areas where mistakes are made as well as area where students (as a whole) were successful.

Conduct Assessment

Evaluate/Grade submitted lessons.

Provide Feedback and Remediation

Provide feedback with details on what was missed, suggestions on how to do it correctly, and what the correct result is.

Part 5. Learner Content

5a: Learning materials

Instructions are made available in week 4 of the course through the Angel course management software. The textbook is titled Microsoft Office 2010 Projects and the lesson starts on page 90 (Cram, 2012). The students are given a data file to work from in the lesson. The instructions for the lesson are for the students to follow along in the textbook as they watch a screencast of the instructor performing the lesson. The screencast is available at this link: http://www.youtube.com/watch?v=HYjMVdiCXfg

After watching the screencast, they are to complete the lesson. In addition to completing the lesson as directed in the textbook, the students are to answer the following questions:

1. In Cell A27, answer this question: Besides the scenario illustrated in the book, describe when you would use a pivot table and why.
2. In Cell A28, answer this question: The sales report indicates sales for Salad products declined from 2011 to 2013. What other fact can you tell me about the information in the sales report?

The students will be directed to perform one extra step in the middle of part 2 of the lesson. Directions for this step are located in weekly folder in the course management software. They are to save a copy of the sliced table and chart after completing step 4 of part two. Label it as Step 4 to be turned in.

Data File Contents:

Product	Category	2011	2012	2013
Grilled Brie	Appetizer	400	450	300
Orange Mousse	Dessert	350	300	200
Blueberry Pie	Dessert	80	90	30
Cashew Salad	Salad	50	40	30
Beef with Stilton	Entrée	800	700	100
Ham Salad	Salad	600	500	300
Provencal Chicken	Entrée	300	200	150
Pineapple Salad	Salad	650	550	350
Avocado Chicken	Entrée	200	240	200
Tofu Casserole	Entrée	550	500	400
Braised Veal Stew	Entrée	900	890	600
Yam Salad	Salad	500	400	350
Raspberry Tart	Dessert	420	400	250
Dark Chocolate Cake	Dessert	300	340	120
Blue Cheese Salad	Salad	600	530	450
Apricot Cobbler	Dessert	500	400	200
Duck Confit	Entrée	90	80	70
Walnut Salad	Salad	700	500	300
Lamb Mediterranean	Entrée	500	480	350

Olive Salad	Salad	600	590	420
Smoked Salmon Wrap	Appetizer	220	280	90
Mahi Mahi	Entrée	400	500	200
Asparagus Salad	Salad	400	300	100
Roast Chicken	Entrée	350	200	90
Kale Salad	Salad	120	100	30
Pork with Grapefruit	Entrée	290	250	200
Leek Fritters	Appetizer	100	60	40
Quince Pate	Appetizer	90	80	40
Parmesan Mushrooms	Appetizer	150	120	60

Part 1 of the project in the textbook

UNIT D
Excel 2010

Sales Report for Home Organics

As an analyst for Home Organics, you work with a product list already created in Excel to produce a report that analyzes sales over a three-year period. To create the Sales Report, you need to **Create a PivotTable** and **Filter and Chart Results**.

Create a PivotTable

You open the product list, then use the PivotTable function to create a PivotTable that shows yearly sales of each product category ("Appetizer," "Entree," etc.) sold by Home Organics.

Steps:

Hint

The worksheet contains the total sales in each year from 2011 to 2013 of all the Home Organics products. Each product is allocated to a category such as "Appetizer" or "Dessert."

1. Start Excel, open PR D-1.xlsx from the location where you store your Data Files, save it as PR D-Home Organics Sales Analysis to the location where you save the files for this book, double-click the Sheet1 tab, type Sales Data, then press [Enter]
2. Select cells A1:E1, click the Bold button [B] in the Font group, click the Center button in the Alignment group, select cells A1:E30, click the Bottom Border list arrow in the Font group, then click All Borders
3. With cells A1:E30 still selected, click the Insert tab, click PivotTable in the Tables group, verify that the New Worksheet option button is selected, then click OK
   A new worksheet opens with the PivotTable Tools Options and Design tabs available and with the PivotTable task pane open on the right side of the window.
4. Click the Product check box in the PivotTable Field List, notice how all the products are added to the PivotTable starting in cell A3, then click each of the remaining check boxes in the PivotTable Field List as shown in Figure D-16
   All the data from the list is added to the PivotTable, with each product assigned to a different row.

Hint

You make each category a row label so you can analyze how much money each product category makes in each of the three years.

5. Click Product in the Row Labels area of the PivotTable task pane, then click Move Down
   The products are sorted and summarized by category.
6. Click cell B3, click Field Settings in the Active Field group on the PivotTable Tools Options tab, scroll the options in the Summarize value field by list, click Count, then click OK
   You have data for five appetizers, five desserts, ten entrées, and nine salads.
7. Click Field Settings, click Sum, click the Show Values As tab, click the Show values as list arrow, scroll the list of options to view how you can show values in the PivotTable report, scroll up and click % of Grand Total as shown in Figure D-17, then click OK
   The setting % of Grand Total shows each category of sales as a percentage of total sales.

Hint

Notice that sales of Appetizers in 2011 were 8.56 percent of total 2011 sales.

8. Click the Field Settings button, click the Show Values As tab, click the Show values as list arrow, click No Calculation, then click OK
9. Select cells B3:D37, click the Home tab, click the Accounting Number Format button [$] in the Number group, then name the sheet tab Product Sales

Trouble

Click the More button in the Styles group if you do not see the Cell Styles button.

10. Click cell A1, type Home Organics Sales Report, merge and center the title across cells A1:D1, click the Cell Styles button in the Styles group, click Heading 1, click the Align Text Left button in the Alignment group, click cell B3, then save the workbook
    The worksheet appears as shown in Figure D-18.

Part 2 of the project in the textbook

UNIT D
Excel 2010

Sales Report (continued)

Filter and Chart Results

You create a chart to represent the data in the PivotTable and then use the slicer to filter data. The completed sales report appears as shown in Figure D-21.

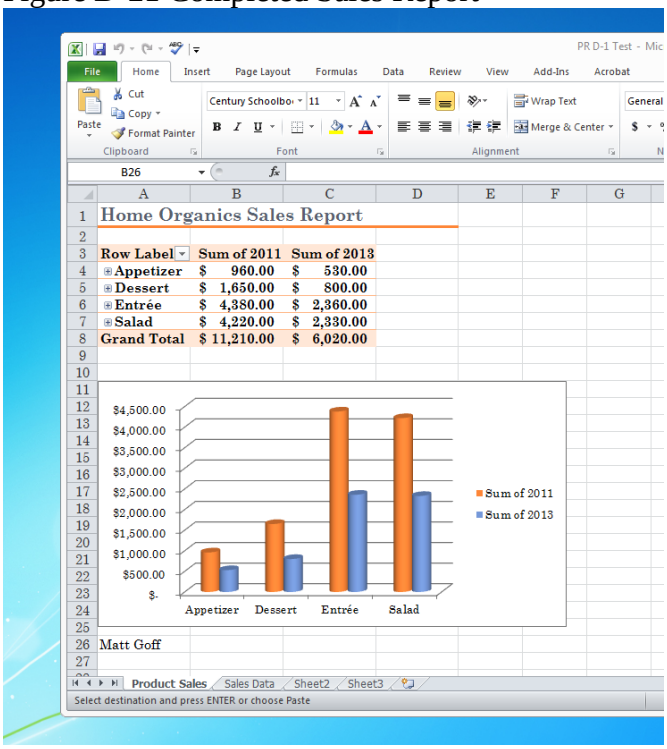
Steps:

1. As shown in Figure D-19, click the Collapse Outline button ⊟ to the left of Appetizer to collapse the list of appetizers so only the category name shows, then click ⊟ next to Dessert, Entrée, and Salad
2. Select cells A4:D8, click the Insert tab, click the Column button in the Charts group, then click Clustered Cylinder
3. Drag the chart down so that its upper-left corner is positioned in cell A11, then click the 2012 check box in the PivotTable Field List to deselect it
   Only data for 2011 and 2013 is shown. As you can see, Home Organics experienced a significant reduction in sales of entrées and salads between 2011 and 2013.
4. Click anywhere in the PivotTable (for example, cell B4), click the PivotTable Tools Options tab, click Insert Slicer in the Sort & Filter group, click the Category check box, click OK, click Dessert in the slicer, then move the slicer so you can see the chart and PivotTable as shown in Figure D-20
   Only the sales of items in the Dessert category are shown in the PivotTable and the chart. The slicer provides you with a quick and easy way to show only the data you want to study. You use options in the PivotTable to view the data related to specific products.
5. Click the Clear Filter button to restore the slicer, click anywhere in the PivotTable, click Product in the lower-left corner of the chart, click the (Select All) check box to deselect it, click the check box next to "Asparagus Salad", "Cashew Salad", and "Dark Chocolate Cake", click OK, click the Expand button ⊞ next to "Dessert" in the PivotTable, then click ⊞ next to "Salad"
   You can quickly compare the drop in sales for any combination of products and categories.
6. Click the Collapse Outline button ⊟ next to "Dessert", click ⊟ next to "Salad", click Product in the chart, click the (Select All) check box, then click OK
   The chart again compares the sales for 2011 and 2013 in all four categories.
7. Click the Sales Data sheet tab, click cell E6, type 100, press [Enter], click the Product Sales tab, click anywhere in the PivotTable, click the PivotTable Tools Options tab, then click the Refresh button in the Data group
   Each time you change the data used to build the PivotTable, you need to refresh the PivotTable.
8. Click the chart, click the PivotChart Tools Analyze tab, click the Field Buttons list arrow in the Show/Hide group, then click Hide All
9. Click the Page Layout tab, click Themes, select Oriel, click the slicer, press [Delete], type your name in cell A26, save the workbook, submit a copy to your instructor, then close the workbook
   The completed Sales Report appears as shown in Figure D-21.

Additional Practice

For additional practice with the skills presented in this project, complete Independent Challenge 3.

Figure D-21 Completed Sales Report



The students have one week to complete and turn in the lesson as homework along with two other lessons.

5b: Assessment materials

The checklist below will be used to grade and assess the students' performance. The steps in the process are formative and the two final questions are summative. Students may earn up to 25 points for the lesson.

Assignment Checklist		
Lesson:	Unit D: Excel Projects II – Project 3: Job Sales Report for Home Organics	
Event	**Point Possible**	**Points Earned**
File named correctly	3	
Titles bold, centered, underlined	1	
Pivot table is created on new worksheet	1	
All data from the list is added to the pivot table	2	
Projects are sorted and summarized properly	1	
Appetizers in 2011 were 8.56% of total 2011 sales	1	
Values are formatted accounting format	1	
Sheet tab is labeled as Product Sales	1	

Correct title added to the table and formatted with the correct style	1	
A correctly sliced table and chart are included in homework	3	
Groups are collapsed	1	
Clustered Cylinder chart was used	1	
Chart was position from cell A11	1	
The value of 100 was entered in cell E6	1	
Hide All was selected only showing the row labels and 2011 & 2013	3	
Oriel Theme was applied.	1	
Name was added to cell A26	1	
Question was answered in cell A27	1	
Total Points	25	

5c: Technology tool rationale

This lesson is in an online course about the use of Microsoft Office application software. It makes sense to use technology to teach about technology.

Angel learning management software is used to administer the course. It offers the latest online classroom tools for e-learning and is necessary for a wide range of online course requirements.

Screencast-o-matic screencast software is used to demonstrate the steps of the lesson. Screencasts allow instructors to take a digital video of what they are doing on a computer desktop as well as narrate the video while recording. Students respond positively to screencast because it adds an important dimension to the course material. It also offers a more personalized teaching approach.

While the learning management software offers assignment drop boxes for submission of homework and assignments, email is used instead. Email provides a personal touch and allows for more flexibility for both the student and the teacher. This lesson will be submitted as an email attachment. The instructor will reply with personalized feedback including screen capture illustrations and short video clips to enhance student understanding.

Part 6: Formative Evaluation Plan

6a: Expert Review Plan

The subject matter expert is Susan Goff. She is a college administrator who previously taught this subject matter for over 12 years. Susan has a BS in Computer Science and an MBA. She is also a doctoral candidate in Education. She was asked to evaluate the content of the lesson as well as the delivery and evaluation methods.

The following questions were asked:

- Is the lesson engaging to students?
- Is the purpose and expectations clearly stated?
- Is the content appropriate for the level of students?
- Are there any technical problems with the process?
- Are the lesson components appropriate and consistent with the learning outcomes?
- Are the delivery methods appropriate?
- Are the formative and summative evaluation methods effective?
- Are there appropriate reiterative and feedback methods used?
- What other changes or suggestions do you have?

Revisions suggested by the SME will be made prior to the one-to-one evaluation.

6b: One-to-One Evaluation

This evaluation will be conducted individually with one or two of the students. In contrast to the SME review, the students will be looking at the lesson from a learner's point of view. The perspective is different in that the students do not teach the subject and are not familiar with the lesson outcomes. The one-to-one evaluation is similar to the SME evaluation because the same questions will be asked. However, focus will be on typographical errors, unclear sentences, poor or missing directions, inappropriate examples, unfamiliar vocabulary, mislabeled illustrations, and illustrations that do not communicate intent. The purpose is to determine if there are any errors or lack of clarity in the format or instructions. It is important to determine if the learners understand the instruction.

Revisions suggested in the one-to-one evaluation will be made prior to the small group evaluation.

6c: Small Group Evaluation

Once the one-to-one revisions are complete the course will be presented to a group of 4 to 5 teachers and classified staff who have expressed an interest in the subject matter. Traditionally, this group would be made up of the learners/students, but I would choose these members rather than students since students will be involved in both the one-to-one and the field trial. At this point, more feedback from impartial group members in the field of education would seem more valuable and appropriate. The group members are adults just like the learners. It is just that their view of the lesson will have the experience of time spent in higher education. The designer will not take part in these evaluations, but will be available to answer questions once the evaluations are completed. The same questions will be presented to the small group as with the SME and the students. However, additional questions such as:

- Is the instruction conducted at the correct level?
- Was the lesson completed in an appropriate time frame?
- Where the student successful and why?
- How did the students feel about the instruction?
- Are the revisions made in the one-to-one evaluation satisfactory?

The purpose will be to check the effectiveness of the revisions based on the one-to-one data.

6d: Field Trial

Once revisions have been made from the small group evaluation, the lesson will be presented to the students in the course by the SME. The purpose for the field trial is to determine the effectiveness and clarity of the instruction. The students will also be asked what they thought of the lesson. The lesson will only be graded on participation, but the formative review of the process and the summative review of the outcomes will be made by the SME. The SME will make final revisions as necessary. The purpose is to observe the lesson in a realistic environment.

Part 7. Formative Evaluation Report

7a: Evaluation survey

Reviewer	Susan Goff
Date	7/25/11
Course	Computers in Business
Course No.	BA 231
Lesson	Pivot Table Lesson
Designer	Matt Goff
Questions and Comments	
Is the lesson engaging to students?	
The video is a nice complement to the text instruction and should catch their attention. Pivot tables are also used routinely in business and being able to use them is a desirable skill which will be important to many of the students. The data file used is also easy for students to understand.	
Is the purpose of the expectations clearly stated?	
The part of the lesson that asks the student to save a copy that is not contained in the text needs to be more clearly defined in terms of work flow.	
Is the content appropriate for the level of students?	
Pivot tables are beyond an Excel basic user level, which would be appropriated for student with the prerequisite knowledge described in this project.	
Are there any technical problems with the process?	
There aren't any apparent technical problems.	

Are the lesson components appropriate and consistent with the learning outcomes?
With the exception of "Given sales data expressed in a Chart, learners can analyze variances and spot trends," the lesson components are aligned well with the learning outcomes. This lesson is more focused on excel mechanics rather than data analysis although there is one question at the end that does lightly touch on this concept.
Are the delivery methods appropriate?
Yes, the combination of using text, video, and hands-on practice for the lesson works to engage multiple types of learners.
Are the formative and summative evaluation methods effective?
The formative evaluation seems appropriate, but the summative evaluation could be stronger. There is no opportunity for student to perform the learned skills independently from the lesson.
Are there appropriate reiterative and feedback methods used?
The feedback methods are excellent for this lesson and the timeliness of the feedback is addressed and appropriate for an online class.
What other changes or suggestions do you have?
You might think about giving the students an opportunity to experiment more with pivot tables.

7b: Report of expert review

The SME made a few suggestions. None were entirely unexpected. I indicated the students were to submit step 4 in part 2 of the lesson, but did not explain how they were directed to do so. She also commented on the lack of summative evaluation and the analysis portion of the project not being very strong. She suggested an opportunity for the students to experiment more with pivot tables. She stated the lesson subject was important and the level of instruction was appropriate for the course. She liked the use of hands-on practice, video, and text for the instruction. She felt the presentation of the content was engaging. She felt the feedback methods were excellent an appropriate for an online class.

7c: Designer's response to review

I am aware of the imbalance of summative evaluation compared to the amount of formative evaluation. The entire course is centered on formative rather than summative evaluation. I also realize the analysis portion is not very strong. The only reason "analysis" is included as an objective is because I ask the students to answer a question about a determination they can make

by looking at the information presented in the report. I like the question because it asks the students to think. I could remove the outcome, but I felt it was safe to leave the outcome there because the students actually have to analyze something. Because this is only one lesson in an entire course, it is difficult to see that the students have a summative final project where they are expected to demonstrate the skills they have learned in many of the lessons. I have changed the wording above to indicate where the directions are located for the students to turn in step 4 of part 2. I was not clear before. Overall, I was pleased with the SME review. I felt like a chef serving his food to a food critic.

Part 8. Standards Grid

Professional Standards Addressed (AECT)
The following standards, developed by the Association for Educational Communications and Technology (AECT), and used in the accreditation process established by the National Council for Accreditation of Teacher Education (NCATE), are addressed to some degree in this course. The numbers of the standards correspond to the numbers next to the course tasks show on the list of assignments. Not all standards are addressed explicitly through student work.

		Assignments meeting standard in whole or part
Standard 1: DESIGN		
1.1 Instructional Systems Design (ISD)	X	ID Project
1.1.1 Analyzing	X	ID Project
1.1.2 Designing	X	ID Project
1.1.3 Developing	X	ID Project
1.1.4 Implementing	X	ID Project
1.1.5 Evaluating	X	Selected Discussion Forums; ID Project
1.2 Message Design		
1.3 Instructional Strategies	X	ID Project
1.4 Learner Characteristics	X	ID Project
Standard 2: DEVELOPMENT		
2.0 (includes 2.0.1 to 2.0.8)	X	ID Project
2.1 Print Technologies	X	Reading Quiz; ID Projects
2.2 Audiovisual Technologies		
2.3 Computer-Based Technologies	X	(all assignments)
2.4 Integrated Technologies		
Standard 3: UTILIZATION		
3.0 (includes 3.0.1 & 3.0.2)		
3.1 Media Utilization	X	(all assignments)
3.2 Diffusion of Innovations		
3.3 Implementation and Institutionalization	X	ID Project
3.4 Policies and Regulations		
Standard 4: MANAGEMENT		

4.0 (includes 4.0.1 & 4.0.3)		
4.1 Project Management		
4.2 Resource Management		
4.3 Delivery System Management		
4.4 Information Management		
Standard 5: EVALUATION		
5.1 Problem Analysis	X	
5.2 Criterion-Referenced Measurement	X	ID Project
5.3 Formative and Summative Evaluation	X	ID Project
5.4 Long-Range Planning		

COURSE GOALS & OBJECTIVES

The overall goal for the course is for each student to consider and use the systematic process of instructional design to create an instructional product. To achieve this goal, students will engage in activities that promote reflective practice, emphasize realistic contexts, and employ a number of communications technologies. Following the course, students will be able to:

1. Discuss the historical development of the practice of instructional design with regard to factors that led to its development and the rationale for its use

2. Describe at least two reasons why instructional design models are useful

3. Identify at least six instructional design models and classify them according to their use

4. Compare and contrast the major elements of three theories of learning as they relate to instructional design

5. Define "instructional design."

6. Define the word "systematic" as it relates to instructional design

7. Define "learning" and synthesize its definition with the practice of instructional design

8. Relate the design of instruction to the term "educational (or "instructional") technology"

9. Describe the major components of the instructional design process and the functions of models in the design process

10. Provide a succinct summary of various learning contexts (declarative knowledge, conceptual, declarative, principle, problem-solving, cognitive, attitudinal, and psychomotor)

11. Build an instructional design product that integrates major aspects of the systematic process and make this available on the web.

    a. Describe the rationale for and processes associated with needs, learner, context, goal, and task analyses

        i. Create and conduct various aspects of a front-end analysis

        ii. Identify methods and materials for communicating subject matter that are contextually relevant

    b. Describe the rationale for and processes associated with creating design documents (objectives, motivation, etc.)

        i. Construct clear instructional goals and objectives

        ii. Develop a motivational design for a specific instructional task

        iii. Develop assessments that accurately measure performance objectives

    c. Select and implement instructional strategies for selected learning tasks

        i. Select appropriate media tools that support instructional design decisions

    d. Describe the rationale and processes associated with the formative evaluation of instructional products

        i. Create a plan for formative evaluation

12. Identify and use technology resources to enable and empower learners with diverse backgrounds, characteristics, and abilities.

13. Apply state and national content standards to the development of instructional products

14. Meet selected professional standards developed by the Association for Educational Communications and Technology

15. Use various technological tools for instructional and professional communication

AECT STANDARDS (Applicable to EDTECH 503)

1.0 Design

1.1 Instructional Systems Design

1.1.a Utilize and implement design principles which specify optimal conditions for learning.

1.1.b Identify a variety of instructional systems design models and apply at least one model.

1.1.1 Analyzing

1.1.1.a Write appropriate objectives for specific content and outcome levels.

1.1.1.b Analyze instructional tasks, content, and context.

1.1.2 Designing

1.1.2.a Create a plan for a topic of a content area (e.g., a thematic unit, a text chapter, an interdisciplinary unit) to demonstrate application of the principles of macro-level design.

1.1.2.b Create instructional plans (micro-level design) that address the needs of all learners, including appropriate accommodations for learners with special needs.

1.1.2.d Incorporate contemporary instructional technology processes in the development of interactive lessons that promote student learning.

1.1.3 Developing

1.1.3.a Produce instructional materials which require the use of multiple media (e.g., computers, video, projection).

1.1.3.b Demonstrate personal skill development with at least one: computer authoring application, video tool, or electronic communication application.

1.1.4 Implementing

1.1.4.a Use instructional plans and materials which they have produced in contextualized instructional settings (e.g., practica, field experiences, training) that address the needs of all learners, including appropriate accommodations for learners with special needs.

1.1.5 Evaluating

1.1.5.a Utilize a variety of assessment measures to determine the adequacy of learning and instruction.

1.1.5.b Demonstrate the use of formative and summative evaluation within practice and contextualized field experiences.

1.1.5.c Demonstrate congruency among goals/objectives, instructional strategies, and assessment measures.

1.3 Instructional Strategies

1.3.a Select instructional strategies appropriate for a variety of learner characteristics and learning situations.

1.3.b Identify at least one instructional model and demonstrate appropriate contextualized application within practice and field experiences.

1.3.c Analyze their selection of instructional strategies and/or models as influenced by the learning situation, nature of the specific content, and type of learner objective.

1.3.d Select motivational strategies appropriate for the target learners, task, and learning situation.

1.4 Learner Characteristics

1.4.a Identify a broad range of observed and hypothetical learner characteristics for their particular area(s) of preparation.

1.4.b Describe and/or document specific learner characteristics which influence the selection of instructional strategies.

1.4.c Describe and/or document specific learner characteristics which influence the implementation of instructional strategies.

2.0 Development

2.0.1 Select appropriate media to produce effective learning environments using technology resources.

2.0.2 Use appropriate analog and digital productivity tools to develop instructional and professional products.

2.0.3 Apply instructional design principles to select appropriate technological tools for the development of instructional and professional products.

2.0.4 Apply appropriate learning and psychological theories to the selection of appropriate technological tools and to the development of instructional and professional products.

2.0.5 Apply appropriate evaluation strategies and techniques for assessing effectiveness of instructional and professional products.

2.0.6 Use the results of evaluation methods and techniques to revise and update instructional and professional products.

2.0.7 Contribute to a professional portfolio by developing and selecting a variety of productions for inclusion in the portfolio.

2.1 Print Technologies

2.1.3 Use presentation application software to produce presentations and supplementary materials for instructional and professional purposes.

2.1.4 Produce instructional and professional products using various aspects of integrated application programs.

2.3 Computer-Based Technologies

2.3.2 Design, produce, and use digital information with computer-based technologies.

3.0 Utilization

3.1 Media Utilization

3.1.1 Identify key factors in selecting and using technologies appropriate for learning situations specified in the instructional design process.

3.1.2 Use educational communications and instructional technology (SMETS) resources in a variety of learning contexts.

3.3 Implementation and Institutionalization

3.3.1 Use appropriate instructional materials and strategies in various learning contexts.

3.3.2 Identify and apply techniques for integrating SMETS innovations in various learning contexts.

3.3.3 Identify strategies to maintain use after initial adoption.

4.0 Management

(none specifically addressed in 503)

5.0 Evaluation

5.1 Problem Analysis

5.1.1 Identify and apply problem analysis skills in appropriate school media and educational technology (SMET) contexts (e.g., conduct needs assessments, identify and define problems, identify constraints, identify resources, define learner characteristics, define goals and objectives in instructional systems design, media development and utilization, program management, and evaluation).

5.2 Criterion-referenced Measurement

5.2.1 Develop and apply criterion-referenced measures in a variety of SMET contexts.

5.3 Formative and Summative Evaluation

5.3.1 Develop and apply formative and summative evaluation strategies in a variety of SMET contexts.

SMET = School Media & Educational Technologies

References

Cram, C. (2012). *Office Suites - Microsoft Office 2010: Illustrated Projects* (1st ed.). Boston, MA: Cengage Learning.

Smith, P. L. & Ragan, T. J. (2005). Instructional *Design: Third Edition.* Hoboken, NJ: John Wiley & Sons, Inc.