

DIFFICULTIES STUDENTS EXPERIENCED IN LEARNING TRANSFER PRICING

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Abstract

With the aim of understanding student difficulties in learning and applying higher learning material, we explored the transfer pricing topic taught as a case presentation in an undergraduate accounting program at an Australian university. This study invited 25 students to take part in the study after they had learned the topic and given one week to understand it. We provided a transfer pricing problem that they have earlier faced, by adapting a problem presented in their essential reading. We compared student answers with a model answer prepared before they took on the problem. It also interviewed students to gain further insights into their learning difficulties. The study found that students experienced learning difficulties at various stages in trying the problem.

Introduction

We assume that when students have to learn large amounts of material they face difficulties in understanding it. Students still experience learning difficulties even when they receive a limited quantity of material. To explore this in the accounting discipline we examined transfer pricing, a topic that students reported as difficult to learn, which was also obvious from their consistently poor examination performance for that question.

Transfer pricing decides the selling price for transactions of goods and services between divisions within an organization. Organizations can label their divisions as investment centers or profit centers. This labeling allows directors to evaluate profits or investments made by the divisions. Because directors measure how well they perform by profits and investments made, each Division can increase their own profits and investments ignoring how it influences the organization. Transfer price is the price charged when one Division sells goods or services to another Division. Transfer prices are internal selling prices; they form revenue for the selling Division that increases profits, and cost to the buying Division that decreases profits (Langfield-Smith et al., 2006). The divisions measure the financial performance using some measure of profit.

We explored why students have difficulties in understanding transfer pricing, a topic taught in management accounting course of the accountancy program at an Australian university. The study wanted to examine transfer pricing because it is a topic where students must learn several different ideas, from simple to complex, and interrelate them simultaneously. Studying into student learning difficulties in the transfer pricing topic helps us to understand difficulties met by novice students in learning topics of a higher order which demand sound

understanding of lower level ideas. Using the conclusions of this study, we present a detailed teaching support in a later study. But for now and to this end, the next section outlines cognitive load theory and the relevant literature. Section 3 provides the data collection including problem presentation and participant interviews. Section 4 presents results and discussion, and closing remarks.

Theory and Relevant Literature

Cognitive load theory

This study uses the cognitive load theory to understand data collected from this study to create a suitable teaching design later. The cognitive load theory states teaching design must guide students to discover and build knowledge. Although cognitive load theory has never claimed to be a learning theory, it explains the association between knowledge and learning, and how teaching design can help to foster it (Moreno & Park, 2010).

The two ideas of interest in cognitive load theory, are cognitive load and learning, with teaching design as a mediator. The focus is on how objective task characteristics influence the cognitive load (that is working memory or shortterm memory), and therefore learning. Cognitive load theory assumes the human cognitive architecture has a limited short-term memory and a large long-term memory (Kahneman, 1973; Miller, 1956). The short-term memory makes meaning out of information by thinking, and long-term memory makes meaning out of information automatically (Schneider & Schiffrin, 1977). Shortterm memory is the working memory used to learn new though and behavioral patterns. A role of learning is to transfer an organized pattern of thought or behavior (schema) developed in the working (short-term) memory to longterm memory (that makes it familiar). The transfer then frees up working memory for further learning (Sweller, 1994). Novices use more working memory, because they must think of solving the task, since they lack previously formed thought patterns and behaviors to solving the problem. Experts use, less working memory, because they can access solutions to the problem by calling on previously formed thoughts and behavioral patterns deposited in the long-term memory (Sweller et al., 2011, p.21).

According to this theory, the cognitive load imposed by the task should not exceed the total working memory available for learning to occur. Total working memory available include a quantity of memory available but not used, and three used amounts are additive. They are the intrinsic load, the extraneous load, and the germane load. Intrinsic load arises because of the inherent difficulty included in the task that needs interrelating different ideas. Extraneous load arises because of the poor design of the teaching in helping students to solve a problem. Germane load arises from the student effort exerted on the task (Sweller & Chandler, 1994, p. 192).

Intrinsic cognitive load

Although previous studies agree that teaching design can decrease the cognitive load, but mixed findings exist for intrinsic cognitive load. Some findings suggest that teaching design can decrease the intrinsic cognitive load, by presenting items of information (that is, elements) one after the other, and combining similar items and teaching them together. Some findings suggest the opposite. The learning materials contain different ideas, and learning them about diverse ideas at the same time (Lee et al., 2006; Pollock et al., 2002; van Merriënboer et al., 2003).

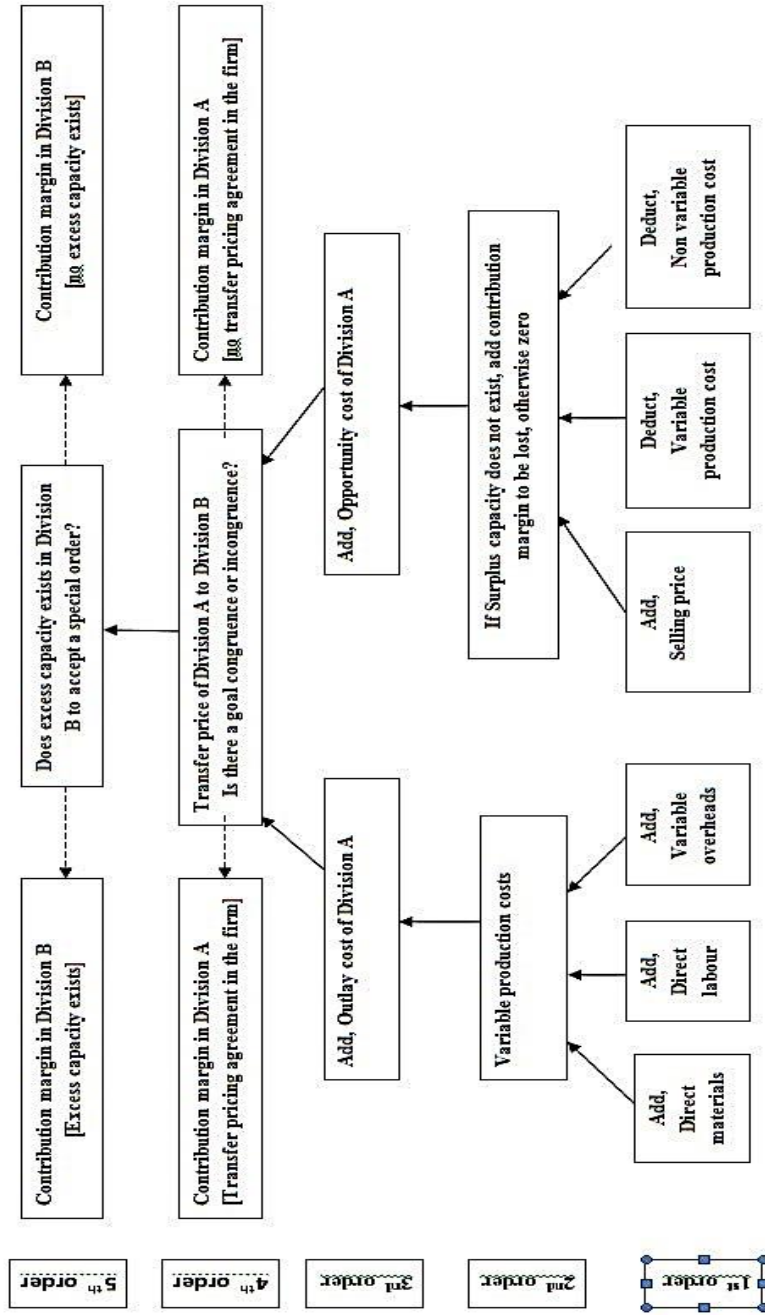
Learning various topics and subject areas can impose different types of thought and behavioral patterns (that is, schema). Some topics and subjects need building simple schema, but others need building complex schema. With accountancy courses, Blaney, Kalyuga, and Sweller (2010) showed that it needs building complex schema. Accountancy topics need, not only learning many new concepts and formulas, but also need to combine these items (that is, elements) in an order simultaneously, to increase learning. This leads to students using too much of working memory, and can decrease learners potential to absorb and build schema to increase learning. The transfer pricing topic is a case example where students need to learn and combine new ideas and formulas to build basic to complex schema (Figure 1).

Method

This study invited students to take part in the study by advertising our research in tutorial classes to study into learning difficulties in transfer pricing according to the ethics agreement. It randomly selected 25 students from those who expressed interest to take part. Students enrolled in this course had preserved a 56 percent average mark, and had an average grade point average of 1.94. The t-tests confirmed that these averages were not statistically different from the total average mark and total average grade point average of students of this management accounting course. The study ensured the mental load arising from instruction did not influence our investigation by having a common teaching instructor for all students. Students had completed the transfer pricing topic before the midterm break, and this study invited them to take part in the study in the first week after the break.

This study gave students taking part in the study a typical problem they had faced in learning transfer pricing, from their essential reading's textbook wrote by Langfield-Smith, Thorne, and Hilton (2006) (Table 1). The problem

Figure 1 Transfer price calculation



had three parts to answer as Part A, Part B, and Part C, using information items learned in the transfer pricing topic.

Part A

Part A, asked to calculate the contribution margin from each unit produced, for each of the divisions, based on the transfer pricing rules of the firm. Part A wanted student to know the meaning of contribution margin as the difference between selling price and variable costs. They should know that variable cost included in a product, changes exactly with the quantity of production. They also should know that variable cost is an addition of direct material, direct labor, and variable overhead). Students should also know the meanings of variable costing and absorption costing. The variable costing assigns costs to a product, and the assigned cost that varies with the quantity of production. The absorption costing assigns costs to a product, and it assigns cost varies and do not vary with the quantity of production. Students should inter-relate these ideas by connecting what comes first with the next, and review them simultaneously. This needed them to make four separate calculations. First, they should calculate selling prices for the two divisions in the firm, the Division A, and the Division B. Second, they should calculate total variable costs for the two divisions separately. Third, they should include the transfer price of Division A, as a buying cost in Division B. Fourth, they should calculate contribution margins for the Division A, and the Division B.

Part B

Part B needed calculating the minimum transfer price that Division A would accepts selling to Division B, if market forces influence the transfer price. Students show know the meaning of transfer price to answer Part B, as the price charged when one business center sells products or service to another business center. Understanding the meaning of transfer price wants to understand the meaning of several other items of information. Students should know that outlay cost means variable costs incurred in production. They should know that opportunity cost means giving up a monetary benefit for choosing one course of action over another. They should know the excess capacity means the unused production quantity that remains after including production needs from internal and external customers. Students should know that transfer price of a production unit is an adding outlay cost of a unit and opportunity cost of a unit. They also should know how to use these meanings and formulas simultaneously, to calculate outlay costs of Division A, and to calculate opportunity cost of Division A.

Part C

Part C wanted students to decide the overall impact of accepting or rejecting a special order received from a customer named Soccerroos, on firm-wide profits. The answering to Part C wanted students to know the meaning of goal congruence, as a decision made by a Division to make profits as great as possible of the firm, and not the Division. This part also wanted student to know the

meanings of incremental revenue, incremental costs, and incremental profits. Incremental revenue is the extra revenue resulting from choosing one course of action against another. Incremental costs are the extra costs resulting from choosing one course of action against another). Incremental profit is extra profits resulting from choosing one course of action against another. Students answering Part C, needed to understand the connections of these meanings. Students needed these connections of meanings to calculate and deciding whether the firm should accept or reject the special order. First, they needed to calculate extra revenue earned by the firm. Second, they needed to calculate extra costs incurred by Division A for selling products to Division B because of the agreement between divisions. Third, students needed to calculate extra costs that Division B incur because of accepting the special order from a customer. Fourth, students needed to calculate extra costs that Division A has to incur in selling finished goods to Division B to meet the special order. Fifth, they needed to calculate the opportunity costs that Division B must bear for accepting the special order. Sixth, they needed to calculate extra profits earned by the firm.

Table 1 Transfer pricing problem

<p>Spike Sports has several divisions. However, only one division transfers products to another internal division. The Polyfabric Division produces a special fabric, Sweatless, which is then transferred to the Sportswear Division. Each unit of the Sweatless fabric is further processed to make tracksuits (each unit of Sweatless fabric makes one tracksuit) by the Sportswear Division, and the tracksuits are sold to customers at the list price of \$250 per unit. Under the existing internal agreement, the Polyfabric Division can only sell to external customers after they have supplied the Sportswear Division with all of their requirements. The existing agreement also stipulates that the Sweatless fabric must be supplied to the Sportswear Division at standard manufacturing cost plus 10 per cent. Assume that unlimited quantities of Sweatless fabric can be purchased and sold on the open market at \$100 per unit.</p>		
<p>The following table shows the detailed standard unit cost structure for each division:</p>		
Standard Manufacturing Costs	Polyfabric (Division A)	Sportswear (Division B)
Direct material	\$25	\$20 [^]
Direct labor	\$25	\$55
Manufacturing overhead	\$10 [*]	\$25 ^{**}
Total standard manufacturing cost per unit	\$60	\$100
<p>[^] Not including transfer price for Sweatless fabric. [*] Manufacturing overhead cost in the Polyfabric Division is 50% fixed and 50% variable. ^{**} Manufacturing overhead cost in the Sportswear Division is 60% fixed and 40% variable. Required: (Part A)</p>		
<p>What is the contribution margin per unit for each division under the existing transfer pricing agreement? (Part B)</p>		

Assume that the existing transfer pricing agreement was cancelled and the managers of each division could act autonomously (including buying and selling on the open market). Use the general transfer pricing rule to calculate the lowest transfer price per unit of Sweatless that would be acceptable to the Polyfabric Division.

(Part C)

Assume that there is *excess capacity* in the Sportswear Division and assume that the

Sportswear Division has received a special order from the Australian Soccer Team (Socceroos) urgently requiring 100 tracksuits at \$200 each for their World Cup campaign in Germany. The Public Relations department has directed the Sportswear Division to accept the special order. From the perspective of the Spike Sports company as a whole, do you agree with the decision to accept the special order? Justify your answer.

Solution points

During the study, students completed each part (A, B, and C) of the transfer pricing problem (Table 2).

Table 2 Objectives of the Interview Tasks

Part A	
<input type="checkbox"/>	Apply given mark-up to determine selling price.
<input type="checkbox"/>	Determine contribution margin.
<input type="checkbox"/>	Apply absorption cost adjustment/calculate variable costs (overhead).
<input type="checkbox"/>	Apply transfer price of A = input price of B.
Part B	
<input type="checkbox"/>	Apply transfer price rule
<input type="checkbox"/>	Apply outlay costs
<input type="checkbox"/>	Apply opportunity cost <ul style="list-style-type: none"> ○ External sales. ○ External costs.
Part C	
<input type="checkbox"/>	Analyse—Goal congruence (company-wide profit).
<input type="checkbox"/>	Incremental revenue.
<input type="checkbox"/>	Incremental cost—(Division A).
<input type="checkbox"/>	Incremental cost—(Division B).

We evaluated students' answers against the model answer prepared during the research design stage (Table 3).

Table 3 Model solution

Model Solution for Part A		
Information item (element)	Polyfabric Division A (\$)	Sportswear Division B (\$)
Selling price	66	250
Variable Cost:		
Direct Material	25	20
Direct Labour	25	55
Manufacturing Overhead	5	10
Transfer Price	-	66
Total Contribution Margin	11	99
Model Solution for Part B		
Using the general transfer pricing rule:		
Minimum transfer price	=	Outlay cost + Opportunity cost
	=	(\$25 + \$25 + \$5) + (\$100 - \$55 - \$15)
	=	\$55 + \$30
	=	\$85
Therefore, the general rule yields a minimum acceptable transfer price to the Polyfabric Division (Division A) of \$85.		
Model Solution for Part C		
Information item (element)		\$
Incremental revenue (per unit)		200
Less: Incremental cost of fabric (Division A)		(55)
Less: Incremental cost of tracksuit (Division B)		(85)
Less: Opportunity costs (Division A)		(30)
Incremental profit to firm		30

Many studies measured students performing in learning as a quantity measure (Chandler & Sweller, 1991; Owen & Sweller, 1985), but this study measures as quantity and quality. It measured student performance using the percentage of wrong answers within the problem solution as a quantity measure, and comments made by students about wrong as answers as a quality measure. Second, we interviewed students, while they took on solving the transfer pricing question. We asked students to think aloud of explaining how they arrived at their solution, to gain an understanding of their thinking, but did not help to

correct errors to the problem. With the consent got from them before taking part in the study, we tape-recorded their thinking-aloud responses. Third, after completing the study, we interviewed students about their solution to get further information about how they arrived at the answer.

Results and Discussion

Part A

Part A needed student to calculate transfer price of Division A using firm's pricing rules (that is, standard manufacturing costs plus 10 percent). Table 4 reports the errors' students made in solving Part A.

Step 1 - Calculate selling price for Division A, and Division B

Using the market price of \$100 rather than calculating and using the selling price (\$66) for Division A is a common error. The problem question stated the correct selling price for Division A as: standard manufacturing cost plus 10%. Most students failed to notice the text in the problem, standard manufacturing costs and did not use it calculate the selling price, but instead used the numerically presented market value of \$100. All students correctly identified the selling price of \$250 for Division B, stated numerically. The following excerpt is from a student interview that typifies this procedural error:

Interviewer (I): Why did you use \$100 as the selling price for Division A?

Student (S): Because it says so here (points to the page) unlimited quantities of fabric can be sold on the open market at \$100.

I: So is this the transfer price from Division A to Division B?

S: Umm, yes, I think so. Well it is the selling price isn't it?

Table 4 Errors Made by Students in Part A (N = 25)

Information item (element)	Percentage Wrong Answers
Step 1 - Selling price (for Division A)	72%
Step 2 - Contribution margin (Divisions A and B)	80%
Step 3 - Transfer price from Division A is an input cost to Division B	52%

Step 2 - Calculate contribution margin

The Step 2 needed students to first calculate the total variable costs for each division, so they can calculate the contribution margin for both divisions. Twenty percent of the students successfully completed this task for both

divisions. Nearly 40 percent wrongly calculated the contribution margin because they could not interrelate information items leading to contribution margin. The remaining 40 percent did not understand calculating contribution margin that needed subtracting variable costs from the selling price. Students calculated the wrong contribution margin for three reasons: wrongly decided that selling price is the market price, wrongly calculated variable costs, or both of these. Students did not know what information items made up variable costs, and that lead them to wrong calculating the contribution margin (that is, selling price minus variable costs). The following interview excerpt typifies it.

I: You have calculated manufacturing overhead as \$10. How did you work that out?

S: Well it's here in the table, \$10.

I: Why do you think it is marked with an asterisk?

S: (Student reads information underneath table). Oh. It is 50% fixed and 50% variable.

I: Does this information change your answer in any way?

S: Maybe (pause). I am not sure, it may be a trick. I don't know. (No change.)

Step 3 - Transfer price of Division A = Purchase price of Division B

Students having the wrong answer did not understand that transfer price of Division A becomes a buying cost of Division B. Only 48 percent of the students displayed completed this step correctly. Of these students, 20 percent used the correct figure of \$66, and the remaining 28 per cent of students used the wrong market price of \$100.

Students who made errors, did not know the meanings of absorption costing and variable costing. The errors here fell into three categories presenting the same underlying misconception. First group of students correctly wrote the transfer price from Division A, as \$66 which is the selling price, but wrongly wrote the buying price for Division B as \$100, which is the market price. Second group of students wrongly wrote the transfer price from Division A which is \$100, but correctly wrote the buying price for Division B as \$66. Third group of students did not include any price as the transfer price from Division A. For example:

I: Have you included all of the variable costs in the Sportswear Division?

S: Yes, I think so.

I: What is that hat (^) next to the direct material price of \$20 in the Sportswear Division?

S: (Reads footnote under table). The direct material price does not include the transfer price. Does that mean we should add it to the direct material?

I: What do you think?

S: Now I think we should. Before, I thought it was already done.

Part B

In Part B, the market forces decided the transfer price from Division A. This part also stated that Division A had extra packaging costs. These costs vary with production quantity and therefore are also variable costs. Table 5 reports the errors' students made in solving Part B of the problem.

Below is an example of a common student error in Part B, where students wrongly calculated the transfer price. The transfer pricing rule yields a minimum acceptable transfer price of \$85 to Division B.

Table 5 Errors Made by Students in Part B (N = 25)

Information item (element)	Percentage Wrong Answer
Step 1 - Outlay costs	28%
Step 2 - Outlay costs (no excess capacity)	40%

Example of common student error in Part B:

Transfer price = Outlay cost + Opportunity cost

$$\begin{aligned} &= (\$25 + \$25 + \$5[1]) + (\$100 - 55 - 0[2] - 15[3]) \\ &= \$85. \end{aligned}$$

Step 1 - Calculate outlay cost

Outlay cost = variable production cost = direct material + direct labor + variable overhead cost. Twenty-eight percent of the students wrongly recalled the formula for the general transfer pricing rule, and wrongly applied the rule to this part of the problem, shown here as [1]. Error [1], and is consistent with the error that students committed in Part A. The student has not removed the fixed manufacturing overhead from total manufacturing overhead. The student wrongly thought outlay cost includes all manufacturing overheads (\$10) but it should only include variable manufacturing overheads (\$5=\$10*50%).

Step 2 - Calculate opportunity cost (no excess capacity)

When there is no excess capacity in Division A, the following formula can be used to calculate opportunity cost. Opportunity cost = External selling price - variable production cost (outlay cost) - variable non-production costs (example, selling and administrative costs). Some students wrongly thought opportunity cost and did not understand that Division A bore an opportunity cost by giving up on selling them to their customers.

In Part B, 40 percent of the students wrongly calculated the opportunity cost of Division A as \$0, and shown here as error [2]. Students wrongly assumed there is the excess capacity in Division A, although the problem stated the Division A can sell unlimited quantities of the product quantity in the open market for \$100.

The interviews provided more evidence that students did not know the meaning of excess capacity, and its association with opportunity cost. For example

I: Why did you write zero for opportunity cost?

S: Because, there is excess capacity. And excess capacity is zero opportunity cost.

I: That's correct, excess capacity is zero opportunity cost. What does excess capacity mean?

S: It is when the supplying division is full. In this question the fabric division [Division A] can sell unlimited quantities to the market and therefore has excess capacity.

Part B assumes that Division A has no excess capacity to produce more for Division B. Therefore, students should not include variable selling costs in calculating transfer price. They include variable packaging (\$5) and delivery costs (\$10), but 40 percent of students did not do it, shown here as error [3].

Part C

In Part C, students should use the transfer pricing rule to calculate the transfer price from Division A. Division B has an excess capacity to meet a special order at \$200 per (sportswear) item. Table 6 reports the errors students made in solving Part C of the problem. Part C assumes that the excess production capacity exists in Division A, and Division B has asked a special order production from Division A.

Step 1 - Goal congruence: Maximize firm-wide profit

The first step in this section is to recognize the meaning of goal congruence where divisional performances result in increasing profits of the firm. Fortyeight percent of students lacked such understanding. In answering Part C to calculate incremental profits to the firm, students made the following common errors.

Table 6 Errors Made by Students in Part C (N = 25)

Information Item	Percentage Wrong Answer
Step 1 - Goal congruence: Maximize firm-wide profit	48%
Step 2 - Incremental revenue (company-wide)	32%
Step 3 - Incremental cost: Division A	62%
Step 4 - Incremental cost: Division B	48%
Step 5 - Opportunity cost: Division A	92%

Students have not removed the fixed cost portion from the total manufacturing overhead, which lead to wrong calculating the extra cost of fabric [1]. The incremental costs in this problem are equal to the variable costs. The total variable costs in Division A should has been \$55 ($25 + 25 + 5 = 55$) and not \$60 ($25 + 25 + 10 = 60$). Students made the same error in calculating the incremental costs for Division B. These errors also arose in Part A, and Part B, because students lacked understanding about variable costs and absorption costs.

Some students correctly included the transfer price of \$85 as buying costs for Division B. the Same students then took away \$85 from Division A, as the transfer price. This error shown as [2] is an example for lack of understanding of the transfer pricing rule.

Information item (element)	Amount (\$)
Incremental revenue	200
Incremental cost of fabric (Division A)	60 [1]
Incremental cost of tracksuit (Division B)	85 [2]
Take away: Transfer price from Division A	85 [2]
Take away: Opportunity costs (Division A)	0 [3]
Incremental profit to the firm	0

Step 2 - Incremental Revenue: Firm-wide

Fifty-two percent of students ignored to evaluate whether producing meeting the special order asked by Division can increase firm-wide profits. These students could not evaluate making use of the excess capacity in Division B can

increase profits of the firm. The following interview excerpt typifies this faulty thinking.

I: Why have you decided to reject the special order?

S: Because, \$200 per tracksuit is less than the normal selling price of \$250, so they must be losing on that.

I: Who do you think is actually losing, Division A, Division B, or the company as a whole?

S: Umm. I'm not sure, I think it is Division B, oh and maybe um the company as a whole.

I: How could you check your answer?

S: (Long pause). I'm not really sure.

Step 3 - Incremental Cost: Division A

This is consistent with errors in Parts A and B, where students did not remove the fixed part from the manufacturing overhead because of lack of understanding of variable costing, shown in error [3]. The incremental costs in this example are equal to the variable costs. The total variable costs in Division A should have been \$55 ($25 + 25 + 5 = 55$) and not \$60 ($25 + 25 + 10 = 60$). Forty percent of students answered \$60, having wrongly included the fixed manufacturing overhead of \$5 (absorption cost). A further 20 percent of students suggested the incremental cost should be the minimum transfer price of \$85, wrongly assuming market forces decide the transfer price (as in Part B).

Step 4 - Incremental Cost: Division B

The variable costing method correctly calculates the cost increase in producing tracksuits in Division A, as \$85 (see Part A). It is direct material (\$20), direct labor (\$55), and the variable manufacturing overhead (\$10). Forty percent of students answered \$100, having included the fixed part of the manufacturing overhead (\$15), and in using the absorption cost method.

Step 5 - Opportunity Cost: Division A

Twenty-three of the 25 students in the sample omitted the opportunity cost of \$30 to Division A, and the firm as a whole as shown in error [3]. Many students got it wrong may be because they could not interrelate ideas learned at a higher order level simultaneously.

Closing Remarks

We learned the following from students' wrong answers for Part A. First, we found that presenting information as numbers wherever possible, rather than as text decreased the cognitive load. Second, students made mistakes because they did not understand the difference between selling price (for Division A) and the market price. Third, students needed to understand the meanings of direct material, direct labor, manufacturing overheads, transfer price, and contribution margin. The selling price for Division A calculation need combining these ideas. Fourth, students have not understood the difference between absorption costing and variable costing. Students need to know several other information items to understand. The absorption costing calculation needs adding direct materials, direct labor and fixed and variable manufacturing overheads. The variable costing needs addition of direct materials, direct labor and variable manufacturing overheads only. The calculation also needed students to use these items of information simultaneously to find out the selling price for Division A (Appendix 2).

We learned from part B, that calculating contribution margin of Division A, needed student to interact with several items of information simultaneously. Interacting these items of information cascaded over three levels that made learning to calculate contribution margin difficult. At the first order level, students needed to know the meaning of direct materials, direct labor, and variable overheads. At the second order level, students needed to know these three types of costs make up variable production costs. At the third order level, they should know that variable production costs become outlay costs for transfer pricing calculation. Students also should know the meanings of selling price, variable production costs, and non-variable production costs. At the second order level, they should also know how the existence of surplus production capacity can influence the opportunity costs. At third order level, students should know the meaning of opportunity costs, and the information items that make up it. At fourth order level, students should know those outlay costs and opportunity costs of Division A production makes up transfer pricing. At fifth order level, students should know goal congruence. They should explore whether firm has a transfer pricing agreement to perform goal congruence, and accordingly calculate the contribution margin (Figure 1).

This study also showed us of the information presented in the problem needed students to split attention between the text and footnotes. Students split attention to integrate information to understand the question also increased the cognitive load. The problem question had asterisk (*), hat (^), and footnotes. These distracted students from reading text, and forced them to split their attention to read what those pointers asked them to read, so they can understand the material. For instance, an asterisk forced them to divide their attention underneath a table to realize that 50 percent of manufacturing overheads do not change, and 50 percent vary with the quantity of production. The Part C errors showed us students lacked understanding of excess capacity and goal congruence to find out incremental profits.

In consistent with Blaney et al (2010), these findings lead us to design a teaching format that isolated each information item from lowest order to highest order, and to teach them in sequentially. The interrelating these information items then occurred progressively at higher order levels (Figure 1). Students received a workbook that explained the concepts and formulas in transfer pricing which they downloaded with lecture notes, to help the new teaching format. Many accounting textbooks force students to split their attention between numbers and text information to learn accounting. As shown by Chandler and Sweller (1991), we replaced previously used problem solving technique with worked example technique to helps students to learn more than just reaching problem solutions. We also added diagrams to our teaching instructions to show students, how to interrelate information items. We also combined essential text information to numbers presented in the worked example to further decrease the cognitive load.

Although we do not claim that cognitive load theory is the only way to explain these findings, nor do we claim that it explains all reasons behind learning difficulties students experienced. For instance, cognitive load theory does not consider the influences of psychological reasons such as student beliefs, expectations, and goals play in learning (Bannert, 2002). Willingness to invest time and effort in learning the task, and students' views of achieving personal goals are also not considered here (Thrash & Elliott, 2001). However, the student learning difficulties identified in this study can help in improving teaching design to help students learn complicated topics such as transfer pricing. These topics need students learning lower level and higher level ideas, and inter-related them to decrease the cognitive load in students working memory.

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