

## **Developing Expertise in E-Commerce: A Content Analysis of Students' Knowledge of Online Auctions**

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### **ABSTRACT**

This paper presents findings from a study investigating the knowledge students acquire from and apply to an online auction assignment. As part of an E-Business and E-Commerce module students were asked to buy and sell goods in an online marketplace and report on their experience for an assignment on the module. A content analysis of a sample of the students' assignments was conducted. The main finding of the study is that, given a framework of professional knowledge and competence, there are considerable imbalances in the knowledge that students acquire from and apply to the online auction assignment. The paper concludes that learning and teaching strategies that recognize and work with such imbalances are appropriate, in order that students' professional capacities in the domain of e-commerce are developed. Recommendations for future research and practice in e-commerce education are provided.

**Keywords:** e-commerce education; online auction; professional knowledge and competence; content analysis

### **1. INTRODUCTION**

One of the tasks facing university educators is how to effectively prepare their students for professional practice. As e-commerce becomes part of everyday business practice, teaching e-commerce concepts in a classroom setting alone risks opening up a gap between that classroom setting and the professional practice which the student will enter. Graduates may leave higher education equipped only with theoretical knowledge and with none of the other skills and capacities appropriate to professional practice. This paper describes an e-commerce assignment designed to develop students' expertise in e-commerce.

For an assignment on an E-Business and E-commerce module, students were required to participate in a real-world C2C e-commerce 'marketplace' e.g. eBay. Participation in the actual marketplace requires students to go beyond the acquisition and application of theoretical knowledge; and to develop their practical and experiential knowledge not only of C2C e-commerce but also of e-commerce in general. In doing so, an online auction site acts as a learning environment for students to develop capacities that contribute to becoming a practicing e-commerce professional.

The paper is organized as follows. The design of the e-

commerce assignment is outlined in section two. The research design is presented in section three; this includes a description of the theoretical framework adopted for the study, the type of sampling, and the design of the coding frame. The results of the data analysis are presented in section four and the findings are discussed in section five. The paper concludes with recommendations for research and practice in e-commerce education.

### **2. E-COMMERCE ASSIGNMENT**

Online consumer-to-consumer (C2C) e-commerce is a fast-growing business area. C2C e-commerce usually refers to the business model that focuses on providing a platform to allow an individual to trade or barter goods and services with another individual. Online auction, a form of C2C e-commerce, is a platform where individuals can trade both new and second-hand goods at a price agreed by buyers and sellers. Some auction sites such as eBay and Yahoo also offer 'e-shop' facilities to those who would like to make a living full-time from buying and selling goods online or who would like to trade part-time as a way of earning a second income.

The reasons for asking students to participate in an online auction were two-fold. First, such an exercise enabled students to participate in both a purchasing and a selling

process; and having experience of buying and selling online is important in order to have a full understanding of e-commerce concepts. Second, the exercise replaces a simulated environment, which is an alternative approach to developing a learning environment for e-commerce education (Ngai, 2004, McCubbrey et al., 1994), with a real-world e-commerce environment so that students can experience at first-hand the issues associated with practicing e-commerce in a 'live' business setting. In this assignment students were asked to buy and sell in a C2C marketplace of their choice. No restriction was placed on the particular auction site that should be used; and depending on the potential market and the availability of goods students could choose to buy and sell on the same or different platforms. Students were asked to submit two reports at the end of the exercise. In the first report students were asked to discuss their experience of participating in the online auction (1750-2000 words). In the second report students were asked to describe their learning experience of participating in the online auction. The findings presented in this paper are based on an analysis of the students' submissions for the second report.

### 3. RESEARCH DESIGN

Our research design was based on classical content analysis (Bauer and Gaskell, 2000). Information is provided here on the theoretical framework; sampling; and the coding frame.

#### 3.1 Theoretical Framework

As indicated previously the rationale for asking students to participate in an online auction was to provide a learning environment to help students acquire the capacity to act as a practicing e-commerce professional. Acting as an effective e-commerce professional implies a capacity not only to apply theoretical concepts, but also a capacity to develop process skills e.g. interpersonal, deliberative, and decision-making skills as well as a capacity to reflect on and use an accumulating store of personal knowledge and experience. Definitions of the types of knowledge used by a practicing professional are provided here. Propositional knowledge: "discipline-based theories and concepts, derived from bodies of coherent systematic knowledge (Wissenschaft); generalizations and practical principles in the applied field of professional action; and specific propositions about particular cases, decisions and actions" (Eraut, 1994: 13). Process knowledge: "acquiring information; skilled behaviour; deliberative processes, e.g., planning and decision-making; giving information; and metaprocesses for directing and controlling one's own behaviour" (Eraut, 1994: 107). Personal knowledge: "All people acquire knowledge through experiences the purposes of which have little overt connection with learning, through social interaction and trying to get things down. Such knowledge covers people and situations encountered, communications received and events and activities experienced through participation or observation. While some of this knowledge is sufficiently processed to be classified as propositional knowledge or process knowledge, much will remain at the level of simple impressions. Nevertheless, impressions

gained from experience contribute to professional action in ways that are still only partially understood" (Eraut, 1994: 107). In sum: a practicing professional, in any domain, is one capable not only of applying discipline-based theories and concepts, but also of developing and applying process knowledge, and of processing and systematizing their personal experience of professional practice.

The research questions guiding our study were (i) what knowledge did the students acquire from and apply to the online auction assignment? (ii) how was the knowledge distributed across the types of propositional, process, and personal knowledge?

#### 3.2 Sampling

Seventy-three students enrolled on the postgraduate e-Business and e-Commerce module for the 2003-2004 academic session. The student population was drawn from MSc Information Systems, MSc Information Management, and MA Librarianship students. Since analyzing the assignments of all seventy-three of the students would have been impractical (amounting to the analysis of some 3,650 sentences or 36,500 words), a sample of assignments was randomly selected. The sampling method used was as follows. As part of the procedures for handing-in their work for marking, students are assigned a number by the administrative staff for counting the number of assignments received for each particular module. Every fifth student numbered was chosen for the sample. Hence, the assignments of fourteen of the seventy-three students (nos. 1, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70) were selected for analysis. This represents 1:5 (19.1 per cent) of the students.

With regard to the unit of analysis potential units of analysis for written discourse include words, sentences, or even larger chunks or segments of discourse e.g. paragraphs. In keeping with other approaches to written discourse the sentence was chosen as the unit of analysis.

#### 3.3 Devising the Coding Frame

The categories for our coding frame were derived from three sources: (i) Eraut's (1994) framework of professional knowledge and competence (ii) the weekly lecture topics and (iii) the data. Hence the coding frame was an outcome of both top-down and bottom-up analysis. We initially devised our coding frame with the help of the three categories from Eraut's framework i.e. professional knowledge, process knowledge, and personal knowledge; and from the topics of the weekly lectures. The authors piloted this initial coding frame on the sample of assignments. A meeting was then held to agree on the codes and the assignment of the codes to the sentences. This involved inter-coder agreement on (i) the definition and scope of the codes and (ii) the meaning of particular sentences, so that the correct code could be assigned. This entailed some re-analysis during the meeting, with the aim being a complete coding of the data. Following the meeting the initial coding frame was revised and rationalized e.g. for example where it was agreed between the coders that one category should be subsumed under another rather than

being a separate code. A sample of the final coding scheme is provided in the Appendix. In sum: a coherent coding scheme was developed with regard to both theory-driven and data-driven considerations; with the reliability of the coding process optimized through open double-coding and mutually agreed definitions and assignment of the codes.

**4. DATA ANALYSIS**

Fourteen assignments consisting in total of 408 sentences were coded. A small number of sentences were not coded as they referred to content that lay outside the boundaries of the coding frame i.e. they were sentences that did not refer to either propositional, process, or personal knowledge. Figure 1 shows the distribution of knowledge across the assignments.

Figure 1 illustrates that just over half the sentences analyzed referred to propositional knowledge (52%); just over a quarter of the sentences referred to process knowledge (27%); and just over a fifth referred to personal knowledge or impressions of the experience of participating in an online auction (21%).

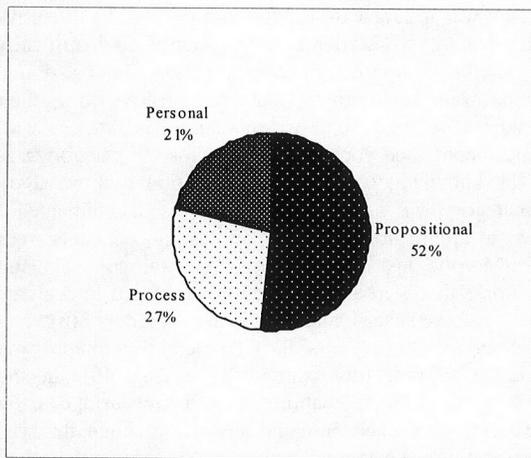


Figure 1 Distribution of Knowledge in the Assignments

**4.1 Propositional Knowledge**

Clearly students drew strongly on their propositional knowledge when participating in the exercise. First, students used the theoretical frameworks to make sense of the phenomena that they observed in C2C e-commerce e.g. business models (23%) and concepts of e-commerce (21%) were the most frequently cited categories of propositional knowledge. Based for example on their knowledge of a dynamic pricing model students understood and observed how a bidding process proceeds and what they could expect at the end of the bidding process. Figure 2 shows the frequency of propositional knowledge categories across the assignments expressed by sub-category.

Secondly, students used the frameworks to scrutinize their course of action, tending to use the frameworks to guide their decisions, in particular with regard to selling. Following business models and concepts of e-commerce, the other most significant categories of propositional knowledge were: market opportunity analysis (10%), interface design (10%), and dealing with transactions (8%). For example the concept of 'framing the market opportunity' (Rayport and Jaworski, 2003) was used to evaluate the market competition. The result of this evaluation along with the concept of pricing strategy enabled the students to determine a fair, attractive, selling price for their products. Use of the theoretical frameworks also appears to help students recognize the potential complexity of business transactions e.g. market opportunity analysis. This could be because such frameworks equipped the students with the ability to reason why and how things worked - an ability that they had not had before. The exercise also provided students with the opportunity to draw on concepts not only taught on this module but also taught on other modules within the department. MSc Information Management students for example applied their knowledge of information search when evaluating and determining the product categories, both for the products they wanted to buy and for the ones they wanted to sell; and applied their knowledge of formulating search strategies when assessing the market and searching for the product information. This is an interesting finding because it was not our initial expectation that students would draw on their propositional knowledge from other modules in order to perform the tasks. Nevertheless, we appreciate and welcome this outcome as students demonstrated their ability to integrate and apply their propositional knowledge from different courses.

**4.2 Process Knowledge**

With propositional knowledge providing students with the conceptual and analytical tools to understand the nature of

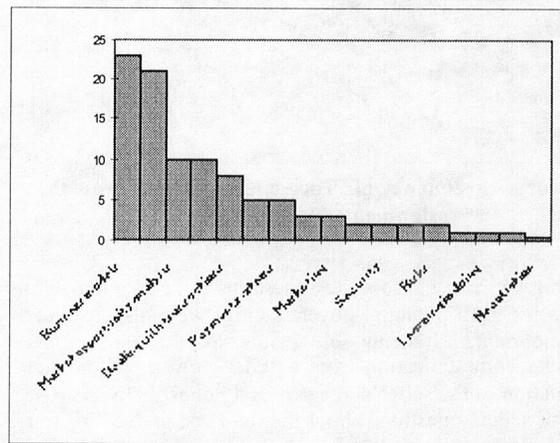


Figure 2 Frequency of Propositional Knowledge Across the Assignments by Sub-Category

their e-commerce experience, the exercise also provided students with the opportunity to acquire process skills for completing a successful e-business transaction (see Fig.3). The most frequently cited categories of process knowledge were: dealing with transactions (21%), marketing (19%), and evaluation (18%). Other significant categories included market opportunity analysis (13%), process knowledge access to propositional knowledge (i.e. sentences referring to the ability to access and use lecture-based concepts in a real-world context of application) (9.5%), and negotiation (9%).

Some students also regarded communication, e.g. writing a product description for the goods on sale, as a difficult yet important skill. The challenge here was to write a product description within the word limit that described the product precisely, and which at the same time would make the product attractive to potential buyers. Many students did not possess such a skill prior to the exercise and felt the task was challenging although rewarding. One student who failed to sell her item in eBay UK but successfully sold another item in Yahoo Taiwan felt that failing to sell her jacket in eBay UK was in part due to the language barrier.

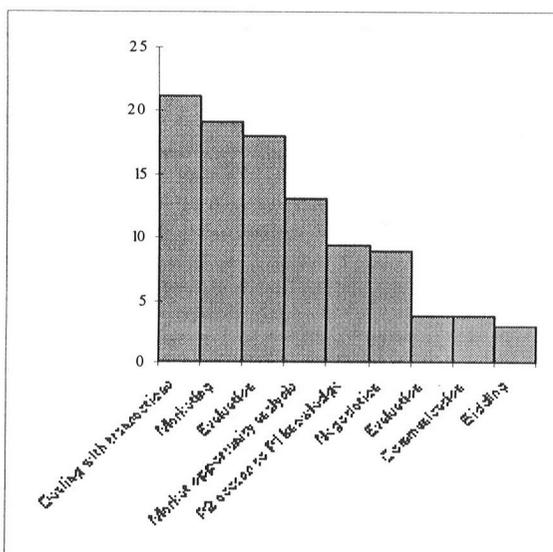


Figure 3 Frequency of Process Knowledge Across the Assignments by Sub-Category

Asking sellers appropriate questions and dealing with enquiries from potential buyers swiftly were also regarded as important. Students said that a speedy response and friendly communication from a seller form a part of their evaluation of the seller's integrity and honesty. In this case, asking sellers questions about the item was indeed to 'test' the sellers' trustworthiness. Some students felt that communicating with sellers prior to bidding builds a relationship with the seller and subsequently makes it easier to negotiate a discount once their bids are successful. Since the students were also in the position of being a buyer, they

recognised the importance of communication with buyers. They argued that swift and speedy response to any inquiries by potential buyers will help to increase their perceived trustworthiness and improve their perceived customer service. Although negotiation skills were perceived to be important, depending on the type of C2C platforms used, not all the students felt they acquired such skills during the exercise. For example, those who purchased or sold a book in Amazon.co.uk's second-hand book marketplace did not feel that they had an opportunity or needed to negotiate with sellers or buyers because the price is fixed and Amazon handles the payment. Nevertheless, those who used eBay to trade expressed that basic negotiation skills were acquired. Most students agreed on their acquisition of evaluation skills from doing the assignment. Students stated that they learned about evaluating goods according to its description, price, and picture provided by sellers. They also stated that they learned about how to interpret feedback from sellers (most of them focused on the seller's reputation and few mentioned the buyer's reputation). Students also learned about evaluating market conditions with the help of theoretical frameworks e.g. number of sellers selling the same or similar items. A further evaluation skill identified, one that was not expected at the outset of the study, was the students' ability to examine and evaluate their own actions. This skill was in fact acquired through writing the reflective report that asked students to explicitly and critically evaluate their experiences consciously. In so doing, students were able to reflect and learn from their experiences. A final point worth making is that 9.5% of sentences contained content that we chose to categorize as 'process knowledge access to propositional knowledge'. This category was assigned to statements that indicated a successful application of the principles and concepts from lectures to the task at hand e.g. "several concepts and frameworks that were taught in class were used to evaluate different marketplaces and platforms" (student 40), and "this experience has allowed for [...] the ability to apply the knowledge to real life examples" (student 40). In the context of our aim of enabling an effective bridge to be made between the classroom and business practice, this was for us a distinctive category to note.

#### 4.3 Personal Knowledge

Figure 4 illustrates the frequency of personal knowledge categories across the assignments. As participating in an online auction would have been a new experience for many of the students, it comes as no surprise that statements about personal experience of bidding were the most frequent (19.5%). The next most frequent sub-categories of personal knowledge were statements about selling (16.1%), and statements about dealing with transactions (12.6%).

Analysis of students' personal knowledge statements also led to the discovery of a new, affective, component in students' experience of participating in the online auction (figure 5 illustrates the frequency of students' 'like', 'dislike', and 'neutral' statements across all sub-categories of personal knowledge). For example, the marketing of a product e.g. writing the product description was an

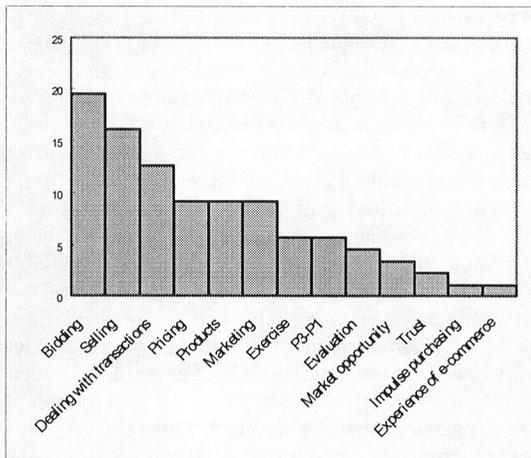


Figure 4 Frequency of Personal Knowledge Across the Assignments by Sub-Category

enjoyable exercise for some, whereas it was considered to be a difficult exercise for others. Such difficulty may have been due partly to a lack of experience in describing products and their attributes; and partly due to a language barrier since many of the students were from non-English speaking backgrounds.

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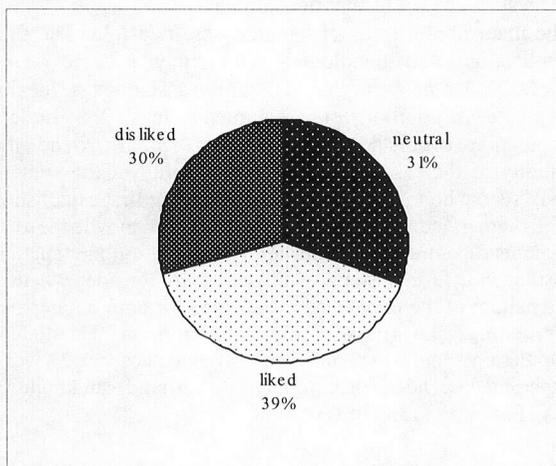


Figure 5 Frequency of Students' 'Like', 'Dislike', and 'Neutral' Statements Across All Sub-Categories of Personal Knowledge

products and their attributes; and partly due to a language barrier since many of the students were from non-English speaking backgrounds.

Most of the categories of personal knowledge identified contained both "likes" and "dislikes" e.g. bidding was an enjoyable process to watch and an enjoyable process when one won. On the other hand it was a frustrating experience if one lost the bid. An interesting point is that 'trust' was either expressed in neutral terms or in terms of a 'dislike' e.g. a feeling of anxiety resulting from an inability to trust sellers unknown to the purchaser. The diversity of personal experience in comparison with the categories of propositional and process knowledge is what one would expect. Propositional and process knowledge are by their nature more stable parts of public knowledge, whereas personal knowledge and experience are more varied. Such variation can act as resource for tutors, where learners can be asked to voice their own experience and to share this experience with others. An individual learner's own experience can then be confirmed or disconfirmed by the experiences of other learners. A student pointed out that the whole exercise is like running an e-commerce company in microcosm. This first hand personal experience has taught them things that they could not learn in the classroom. Students expressed that the exercise is useful, interesting, and enjoyable and one through which they can understand the key concepts of e-commerce better. This suggests that students learned better in an environment that they perceived to be fun. Furthermore, first hand experience helps students feel they have ownership of their knowledge and skills.

By engaging in both buying and selling processes in C2C e-commerce students were able to put themselves in the shoes of both roles. As a buyer they recognised the decision making process undertaken by a buyer prior to and during purchase, and this experience became useful when they were in the position of being a seller. Similarly, being a seller they became aware of the complexity of a selling process and realised and learned about particular selling techniques used to attract buyers. Students on the module had heard about eBay but most of them did not have any practical experience of buying and selling on eBay. Therefore, taking part in eBay was a new experience for most of them. First-timers recorded their anxiety prior to and during participation in eBay, nevertheless they also recorded that they felt more confident after the completion of the first transaction. Students said that by doing the exercise they began to understand the attraction as well as the addiction of online auctions. Some expressed that their perceptions of C2C e-commerce and of second hand goods have changed as a result of doing the exercise. Indeed, some students even expressed their interest in setting up a business in the future.

With regard to the assignment itself, students felt that by writing the report they were able to examine and revisit their personal experiences with a critical eye, and thus learn from their experiences. A final point is that in a small

number of cases we were also able to detect an interaction between personal and propositional knowledge. This is where a student had tried to draw from her experience a general principle e.g. in relation to the bidding process: "to my own experience the last actions [of the bidding process] are vital" (student 70).

## 5. DISCUSSION

The findings from our content analysis give rise to two issues. The first of these concerns the pattern of knowledge that we found across the sample of assignments as a whole and whether this obscures any individual differences within the student population. The second concerns the reliability and validity of our findings.

The focus of our analysis has been the frequency within the sample assignments with which different types of categories and sub-categories of knowledge occurred. Any variations in this frequency with respect to individual differences among the students have not formed a major part of this study (Foster and Lin, 2003). About five out of the fourteen students i.e. just over a third displayed the commonest pattern of knowledge in their assignment, which was: propositional (c. 50%), process (c. 30%), and personal knowledge (c.20%). However the ranges for the different categories of knowledge did vary (propositional knowledge: 31-71%; process knowledge: 0-46%; and personal knowledge: 3-58%) and a high or low percentage score in one category of knowledge clearly impacts on the percentage score for other two categories. One student for example had a score of 58% for personal knowledge. With propositional knowledge at 42% this was clearly at the expense of any description of any process skills acquired. Other students in the sample had much higher than normal allocations of propositional knowledge (70% and 72% respectively); largely at the expense again it appears of a description of any process skills acquired. Further analysis of the data would reveal some of the individual differences between students underlying the overall picture. A related point with regard to the different categories of knowledge is the interrelationship between the three categories of knowledge. We have already mentioned that we were able to identify some interrelationship between process and propositional knowledge, and to a much lesser extent, between personal and propositional knowledge. Thus, the online auction assignment acted as a practical context of application that provided an opportunity for students not only to apply their propositional knowledge, to acquire and practice process skills, and to develop personal knowledge, but also to establish connections between these different types of knowledge e.g. generalizing from the particular experience or making general statements about how particular skills were acquired, such that this knowledge could be utilized for future situations.

The second point for discussion is the reliability and validity of our results. Reliability defined as "agreement among interpreters" (Bauer, 2000), and validity defined as "the degree to which a result correctly represents the text or

context" (Bauer, 2000). Two quality measures were built into the research design i.e. a coherent coding frame and inter-coder agreement in the assignment of codes once the frame had been designed. Both measures contributed to consistency in content analysis process.

It has been stated "the main fallacy of content analysis is the inference of particular intentions or understandings from the text alone. Intentions and reception are features of the communicative situation and do not depend on the text alone: they are co-determined by situational variables" (Bauer, 2000: 145). This is certainly something we found when conducting our own analysis. If a sentence appeared to be open to more than one interpretation, the authors were thrown back on attempting to identify the student's intention in writing the sentence, as a criterion for determining the sentence's meaning. However "it may be possible to exclude certain readings or intentions, especially if the coders share an understanding of the world with the sender or the audience" (Bauer, 2000: 145). This was in fact what the authors were able to do, since the authors shared with the students the domain knowledge on the E-Business and E-Commerce course, as well as some knowledge gleaned from interpersonal discussions between tutor and student.

## 6. CONCLUSION

The research questions guiding this study were: (i) what knowledge did the students acquire from and apply to the online auction assignment? (ii) how was the knowledge distributed across the types of propositional, process, and personal knowledge? Clearly our analysis of students' submissions for the online auction assignment has enabled us to glean some information on this. The major conclusion being that for most of the students, their writing up of their experience of participating in the online auction is often imbalanced with respect to the types of propositional, process, and personal knowledge. Given a framework of professional knowledge and competence this appears to suggest a need for further development.

The main implications of the study are two-fold. The first implication is methodological. Our study is based on an analysis of some twenty per cent of the assignments. Ideally a greater proportion of assignments from the student population could be sampled. This would extend the validity of the results, and the applicability of the content analysis method used. Furthermore, having first established that there is considerable variation in the knowledge that students acquire from and apply to the online auction assignment, further steps would be (i) to consider whether the pattern of the imbalance is the same for both buying and for selling, and (ii) to look for factors in the student population that explain such imbalances e.g. work experience, gender, disciplinary background, and culture (e.g. Foster and Lin, 2003).

The second implication is pedagogical. What use can be made of the findings from the exercise to inform the development of e-commerce education? Eraut's (1993) framework states that practicing professionals draw on

propositional, process, and personal knowledge in performing their roles. The current study provides evidence that there exist imbalances in students' acquisition and application of the knowledge required for professional practice. This would suggest that, in the domain of e-commerce, information systems educators can usefully turn their attention to learning and teaching strategies that recognize and work with such imbalances e.g. encouraging some students to write more about their individual experience of participating in the online auction, encouraging others to incorporate a greater degree of theoretical knowledge into their reflections. In so doing, information systems educators can aim at developing their students' professional capacities in a manner more tailored to redressing such imbalances.

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