



**February 2011**  
**Volume 49 Number 1**  
**Article Number 1RIB6**

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# **A Survey of Educational Needs and Online Training Perceptions in the Wood Products Industry**

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**Abstract:** A sample of 651 wood products industries were surveyed to determine their educational needs and quantify their interest in receiving continuing education via an online format. In the survey, respondents were asked to rank, in order of priority, their educational needs. With a 15.2% response rate, survey respondents (n=99) indicated that an online course in Marketing is the primary need, followed by an online course in Business Strategy Development, given a list of 26 distinct subject areas. Moreover, 88% of members indicated that they are highly interested in receiving continuous education in a Web-based online format.

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## **Introduction**

During the last 15 years the U.S. wood products manufacturing sector has seen an unprecedented loss of competitiveness. Research (Zi & Bullard, 2008) has shown many reasons that this underperformance exists. Moreover, several studies noted cost issues, lack of government support (Quesada & Gazo, 2006), inflation rates, inappropriate human resources (HR), and low investment in research and developmentâ R&Dâ (Hovgaard & Hansen, 2004) as main reasons for this underperformance.

Significant research has been conducted related to improving business performance in the wood products industry by recommending the deployment of different business strategies (Cumbo, Kline, & Bumgardner, 2006; Gagnon & Michael, 2003), yet a transition from research to education and training still must be addressed. Industry training continues to be conducted using mainly face-to-face methods through Extension programs, and little has been accomplished to provide alternative delivery methods, such as e-learning. These opportunities need to be addressed by Extension programs as a way to reach large audiences, improve quality, and decrease cost of education (Menchaca & Bekele, 2008).

E-learning is the latest vehicle for distance learning. According to Abels (2005), distance learning is a person's ability in one part of the world to teach, by transmitting material that will be used by learners situated in any other part of the world, by diverse delivery methods. E-learning refers to the use of internet technologies to deliver a broad array of solutions that enhance knowledge and performance (Rosenberg, 2001).

Employee training can be a powerful tool to ensure process quality and improve competitiveness. However, training activities are costly and time-consuming, which makes Internet-based training very appealing, since it is less costly because it does not need physical classroom facilities and its scheduling is much more convenient. Moreover, e-learning makes it possible to have as instructors experts who would otherwise be very difficult, if not impossible, to reach. Companies such as IBM, Samsung, and Cisco Systems make extensive use of e-learning to train their employees (Kim, 2006). According to MacDonald and Thompson (2005), e-learning could reduce costs for learners and employers and at the same time, obtain superior results.

Ma (2006) indicates two types of e-learning communication exist: asynchronous and synchronous e-learning. In asynchronous e-learning, learners do not depend on a specific schedule. Moreover, they can see class materials at a time of their convenience and as many times as required. In the synchronous mode, teaching sessions are delivered at a scheduled time (Rosenberg, 2001). Both methods can be combined, but the preference is the asynchronous method (Ma, 2006). Top trends (WorldWideLearn, 2009) in e-learning reflect the need to use new technology, integrate e-learning with the firm's infrastructure, and access to professionals in different parts of the world.

The wood products community has not yet leveraged the advantages of e-learning, and very little is available online regarding wood science and technology. The purpose of the research reported here involves application of a survey methodology to evaluate the educational needs in U.S. wood products industries to determine what subject areas are most critical in their competitive context. As a second research goal, a determination of the level of interest among wood products firms to carry out formal or continuing education via an online format was pursued.

The results will be integrated with theories of distance education, networked learning (Jones, Ferreday, & Hodgson, 2008), cooperative freedom, learning environments (Benigno & Trentin, 2000), and successful work teams to provide the wood products industry with more effective and efficient training and social networking methods. Although HR training can be designed for all subjects areas (Robbins & DeCenzo, 2008), the following stage of the research reported here involves a focus on Web-based online training to address the top 10 most important subject areas as determined in the research.

## Methodology

Our survey questionnaire was based on a multiple response format. Respondents were asked to check a specific number of items from a total number of items. This type of response format allowed the researcher to extract exactly the information needed, making the procedure efficient and straightforward (Santos, 2000).

Respondents were asked to select the five most important educational needs from a list of 26 subject areas. The list of subjects was designed from a consultation of six professors at Virginia Tech in the areas of marketing, manufacturing, and business management.

The sampled population included members of the Cabinet Makers Association, Wood Manufacturing Components Associations, Virginia Wood Products Exporters, and Virginia Forest Products Association. This sample involved companies from different locations around the country, for a total of 651 companies. A total of 651 email invitations were sent. Survey participants were told to submit a response in online format or notify the research team if they prefer to return the survey by mail in hardcopy format. At the end of an 8-week period, 99 responses were returned for analysis. No reminder was sent in between due to time and cost issues (Armstrong & Overton, 1977); therefore, the issue of non-response bias is not addressed in the research reported here. Also, further examination of the data reveals no abnormalities as recommended by Israel (2009). According to Fowler (2002), when response rates are high (15.2%), the probability of error is small.

## Results and Discussion

Ninety-nine surveys were returned for the study, a 15.2% response rate. All received surveys were submitted by respondents using an online format. With regard to demographics (Table 1), 63 questionnaires were answered by firms identified as having one to five employees (63.6%); eight by firms identified as having six to 10 employees (8.1%); one by a firm identified as having 11 to 15 employees (1%); five by firms identified as having 16 to 20 employees (5.1%); one by a firm identified as having 21 to 25 employees (1%); seven by firms identified as having 26 to 50 employees (7.1%); seven by firms identified as having 51 to 100 employees (7.1%); and seven firms identified as having 101 or more employees (7.1%). Similar studies in the wood products industry have shown similar percent responses in terms of firm size (Reeb, Leavengood, & Knowles, 2009; Hansen & Smith, 1997).

Also, the questionnaire asked the role of the person completing the survey (Table 1). The results show that 67 (74.4%) surveys were completed by the firm's owner; nine surveys were completed by sales and marketing persons (10%); four surveys were completed by a manufacturing supervisor (4.4%); nine surveys were completed by other positions not described in the survey (10%); and one firm did not respond to the question (1.1%).

**Table 1.**  
Firms' Demographics

Firm Size	Relative Frequency
1 to 5 employees	63.64%
6 to 10 employees	8.08%
11 to 15 employees	1.01%
16 to 20 employees	5.05%
21 to 25 employees	1.01%
26 to 50 employees	7.07%
51 to 100 employees	7.07%

101 or more employees	7.07%
No answer	0.00%
<b>Role of Survey Respondent</b>	<b>Relative Frequency</b>
Owner	74.4%
Manufacturing Supervisor	4.4%
Manufacturing Crafts Person	0.0%
Customer Service and Office Support	0.0%
Sales and Marketing	10.0%
Accounting and Finance	0.0%
Other	10.0%
No answer	1.1%

Results in Table 2 show that Marketing is the most important educational need identified by the surveyed firms, with 71 responses. Scoring second on the list is Business Strategy Development, with 56 votes, and third is Financial Management, with 38 votes. Fourth place was scored by Product Innovation, with 35 votes, and fifth place involved Manufacturing Issues Related to Wood, with 32 votes. Lean Thinking Basics was the sixth-ranked topic, with 25 votes, along with Motivation and Team Building. The last subject areas of the top 10 can be seen in Table 2.

One possible explanation for Marketing and Business Strategy Development indicated as the most important educational needs in wood products industries could be the increasing concern by this industry to capture better and more strategic markets. These results might suggest that perhaps firms in this industry are now starting to understand that even in tough times it is necessary to invest resources in learning marketing and business strategies. Similar results were found by Reeb, Leavengood, & Knowles (2009) when they surveyed educational needs in Oregon in 2008.

**Table 2.**  
Assessment of E-Learning Needs of Wood Products Industries

No.	Subject Area	Total	Relative Frequency	Cumulated Frequency
1	Marketing	71	0.154	0.154
2	Business Strategy Development	56	0.121	0.275
3	Financial Management	38	0.082	0.358
4	Product Innovation	35	0.076	0.434
5	Manufacturing Issues Related to Wood	32	0.069	0.503
6		29	0.063	0.566

	5-S: Creating and Sustaining Standardized Work Methods			
7	Lean Thinking Basics	25	0.054	0.620
8	Motivation and Team Building	25	0.054	0.675
9	Allocation of Manufacturing Costs	23	0.050	0.725
10	Advanced Lean Thinking: Creating Work Flow	20	0.043	0.768
11	Automation in Wood Products Companies	17	0.037	0.805
12	Lean Costing	13	0.028	0.833
13	Lean Administration	11	0.024	0.857
14	Hardwood Lumber Grading	8	0.017	0.874
15	Value Stream Mapping	7	0.015	0.889
16	Advanced Lean Thinking: Inventory Management	7	0.015	0.905
17	Developing Log Costs Based on Volume and Value Output	7	0.015	0.920
18	Statistical Quality Control Using Spreadsheets	7	0.015	0.935
19	Leadership Development for the Lean Enterprise	7	0.015	0.950
20	Advanced Hardwood Lumber Drying	6	0.013	0.963
21	Inventory Control	6	0.013	0.976
22	Improving Lumber Drying Quality	3	0.007	0.983
23	Basic Hardwood Lumber Drying	2	0.004	0.987
24	Log Grading and Bucking	2	0.004	0.991
25	Reduction of Sawing Variation and Lumber Target Sizes	2	0.004	0.996
26	Total Productive Maintenance	2	0.004	1.000

Two subjects related to financing were indicated among the top 10: Financial Management (38 votes) and Allocation of Manufacturing Costs (23 votes). If these two subject areas are merged, total votes total 58 votes, more than Business Strategy Development (56 votes). This appreciation of Financial and Cost Allocation Management seems to be a more important educational need than Lean issues (Lean Thinking Basis = 25 votes and Advanced Lean Thinking = 20 votes, total = 45 votes) and Product Innovation (35 = votes). Perhaps the economic pressure on firms in this industry to lower costs and control their assets better

explains in part the motivation to rank these two subject areas higher than Lean and Product Innovation issues.

The survey results indicate that product Innovation has become increasingly important. Innovation can be realized through new products or any major and significant improvement to an existing product, a process improvement, development of a new market, or improvement of the organizational structure of a company (OECD 2005). If Product Innovation (with 35 votes) and Manufacturing Issues Related to Wood (with 32 votes) are added together, they total 67 votes, thus displacing Business Strategy Development (56 votes) from second place. Reeb, Leavengood, and Knowles (2009) found that firms in their research ranked New Product Development as 7th out of 36 educational needs, similar to the findings in the research reported here.

Findings from the research also show that more traditional areas in wood products industries, such as Advanced Hardwood Lumber Drying (with 6 votes), Improving Lumber Drying Quality (with 3 votes), Basic Hardwood Lumber Drying (with 2 votes), Log Grading and Bucking (with 2 votes), and Reduction of Sawing Variation and Lumber Target Sizes (with 2 votes), were ranked low in the list. The reasons for this order in ranking are unknown, but perhaps the majority of the surveyed firms came from the secondary sector rather than the primary industry sector. Reeb, Leavengood, and Knowles (2009), and Hansen and Smith (1997) found similar results.

The second goal of the research reported here was to ask wood products firms about their willingness to embark on continuing education courses under the modality of e-learning (Table 3). The format of the e-learning model proposed is composed of synchronous and asynchronous design. When wood products firms were asked if they would be interested in registering for online education (given that it is available) 88 (88.8%) of 99 respondents overwhelmingly responded affirmatively, especially considering that only 32 (32%) had previously taken an online course in either modality (synchronous or asynchronous mode).

When firms were asked if an online course with a certain level of interaction with the instructors was preferred over one with no or minimum level of interaction, 76 firms responded positively and 54 responded that they would be willing to pay even more if the online course included an opportunity to interact with the instructors. Finally, firms were queried regarding an estimated price range they might be willing to pay. Their response was that the majority (68 of 99) agreed with the suggested price range (Table 3).

**Table 3.**  
Specific Issues About E-Learning

<b>Questions Related to E-Learning</b>	<b>Yes</b>	<b>No</b>	<b>No Answer</b>
If a wood product industry online course was available, would you be interested?	88	11	0
Have you previously completed an online course?	32	67	0
Do you have access to a computer for the purpose of completing online industry-related courses?	98	0	1
Would an online course accessible anytime and anywhere be of more interest to you if it provided online access to an instructor (back and forth questions and answers), instead of a course where you were completely on your own?	76	17	0

Would you be willing to pay more for a course with opportunities to correspond with an instructor compared to those courses where you merely interact with the computer?	54	37	4
Generally online professional two week courses range in price between \$195 and \$275, depending upon course length and breadth of material. Does this price range fall within your budget for professional development?	68	14	6

## Conclusions and Future Research

The multiple response format used in the study reported here allowed for easy data collection and assessment of educational needs for the wood products industry. Marketing, Business Strategy Development, Financial and Cost Management, Lean Thinking Issues, and Product and Process Innovation were the highest ranked educational needs determined. These results are similar to previous related research in the wood products industry.

Also, when firms were asked their opinion and willingness to participate in online education based on the subject areas evaluated, results showed that 88% of respondents would be interested in spending time and money given this mode of instruction. Although previous research by other authors compares knowledge and importance of the subject areas to gain better understanding of the educational needs, the research reported here is still valid in the sense that findings support those of previous research.

Future research should be conducted to understand the real impact and efficacy of online education versus face-to-face education. The effectiveness and efficiency of online education with respect to this market sector needs additional fundamental research to alleviate many misconceptions about online education that the industry and academic venues might have.

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