

# **The Application of Adult Learning Principles in University Vocational Courses Utilizing Web-Based Instructional Technology: A Student Perspective**

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### **Abstract**

The main purpose of this study was to determine the perceptions of the Hashemite University adult students concerning the degree of application of adult learning principles, named andragogy in a Web-based instructional environment. The study surveyed 260 students who were enrolled in the 'Vocational Education' and 'Arabic Teaching Methods' courses offered by the Department of Curriculum and Instruction at the Hashemite University. Students were taught in a traditional mode as well as Web-based formats (i.e. Blackboard system). Descriptive analyses were used to analyze the data collected.

Results of the study indicated overall favorable student' agreement toward the application of andragogy principles in instruction. Students agreed that faculty members are effectively incorporating these principles in Web-based instruction. The study ended by offering a number of implications and suggestions from the practical and theoretical standpoint.

## فعالية تطبيق مبادئ تعلم الراشدين في مساقات جامعية تستخدم التدريس الشبكي الإلكتروني من وجهة نظر الطلاب

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### الملخص

هدفت هذه الدراسة إلى تعرف تصورات طلبة الجامعة الهاشمية بوصفهم متعلمين راشدين لدرجة تطبيق مبادئ تعلم الراشدين (أندراغوجي) في بيئة التدريس الشبكي الإلكتروني. وقد استهدفت هذه الدراسة عينة مكونة من ٢٦٠ طالباً وطالبة سجلوا لدراسة مساعي التربية المهنية وأساليب تدريس اللغة العربية اللذين يطرحهما قسم المناهج وطرق التدريس في الجامعة الهاشمية، علماً بأن طريقة تدريس الطلبة في هذين المساقين جمعت بين الطريقة التقليدية في التدريس وطريقة التدريس الشبكي. وقد أشارت نتائج الدراسة إلى اتفاق الطلبة على تأييد تطبيق مبادئ تعلم الراشدين في التدريس وأن أعضاء هيئة التدريس يمارسون هذه المبادئ بفعالية في تدريسهم الشبكي. وانتهت الدراسة بتقديم مجموعة من التطبيقات العملية والاقتراحات لفعالية أكبر في تطبيق مبادئ تعلم الراشدين في التدريس الشبكي.

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### **Introduction**

In recent years, there has been an increased pressure on higher education institutions to deliver classes via the Web. Web-based instruction is most useful when complimented with traditional instruction allowing more flexibility in teaching on the part of the instructor as well as the student. Adult university students are in demand for challenging learning environments different than that of high-school learning environments. Based on that, Web-based instruction is quickly being adopted by many higher education institutions to deliver instruction (American Society for Training and Development, 1997). Most of students' learning is now acquired through Web-based instruction (Brookfield, 1995) which "enable totally new learning processes" (Ruokamo & Pohjolainen, 2000, p. 22). Students are expected to use available web-based tools (e.g., Blackboard) to gain lifelong learning. However, most university administrators, faculties, and course designers are not incorporating effective learning principles in web-based learning environments (Cahoon, 1998). Therefore, faculties and administrators should use guiding principles to design and evaluate web-based instruction. According to Cahoon (1998) "the use of the Web may require a new commitment to andragogical principles" (p.34). Researchers from the field of technology education and vocational education suggested the need for further research efforts to determine whether adult learning principles, named andragogy, are effectively incorporated in courses delivered via the Web (Brookfield, 1995; Cahoon, 1998; Ryan, Carlton, & Ali, 1999; Simonson, 1997).

According to the education literature, instructional methods have been classified into two generic approaches: (1) andragogy (student-initiated instructional approach), and (2) pedagogy (instructor-initiated instructional approach) (Knowles, 1990). Knowles (1990) defined pedagogy as the "art and science of teaching children" (p. 8). This approach has been utilized by many higher education faculties to teach students (Merriam & Caffarella, 1999). Bash (2003) stated that the "entire educational enterprise, including higher education, has been frozen in the pedagogical model" (p. 61). Knowles (1990) argued that this model is ineffective in teaching adults who learn different than children and proposed the need for a paradigm shift in educational instructional strategies to address the needs of adult learners. The paradigm shift has led to the development of the andragogical model "the art and science of helping adults learn" (p. 8). Knowles, Holton, and Swanson (1998) contend that andragogy, the best known theory of adult learning have reshaped education curriculums at all levels in many parts of the world. Andragogy principles can be used to design effective courses for adults especially with those utilizing web-based instruction. This is an area of academic investigation that has not been explored in higher education settings and deserves further investigation (Cranton, 2000). In a more recent study, Colton (2002) adapted the principles of andragogy for use with Web-based courses. These principles are as follow:

**Learners need to know:** Adults need to know what learning will occur, how learning will be conducted, and why learning is important. Adults need to know, why they need to learn something before learning it. Villa (1994) stated that adults' need to be provided with prior information about the course design and content, thus maximizing their participation and involvement. On the other hand, children play the role of passive recipient of knowledge.

**Self-concept of the learners:** Adults have a self-concept of being responsible for their own decisions, for their own lives, and their own learning. They need to be provided the tools and opportunities for independent, self-directed learning. The self-concept of adults is heavily dependent on a move toward self-direction. Adults see themselves as producers, thus they tend to resist learning that is not congruent with their self-concept (Apps, 1991). In pedagogy the learner is seen as dependent and directed by the teacher. The instructor completely determine course direction, defines course objectives, relevant knowledge, and evaluation methods.

Prior experience of the learner: Adults come into an educational setting with a wide range of experiences which can serve as a basis for new learning. In andragogy, prior experiences of the learner provide a rich resource for learning. The importance of the students' life experiences is emphasized, and the instructor is encouraged to not ignore this source of knowledge (Knowles, 1973). Experiential techniques are used in the classroom such as cases and simulations. In pedagogy, the student is seen as having a limited reservoir of life experiences, and the experiences that the student does bring to the learning situation are treated as trivial. Learning materials such as books, audio-visual aids, and the teacher are valued more than the experience.

Readiness to learn: Because of their prior experiences, adults tend to develop mental habits and biases and may need to reassess their beliefs in order to adopt alternate ways of thinking. In pedagogy, the students are seen as ready to learn anything that the instructor determines that they should learn, and mental habits and biases are not yet developed.

Orientation and motivation to learning: Adults orientation to learning is problem-centered. Thus they are motivated to learn and ready to learn to the extent that they perceive learning will help them perform tasks or deal with problems that can relate to their life situations. In andragogy, the learner is seen as wanting to apply whatever he learns today to tomorrow's real-life situation. In pedagogy, the learner sees education as the process of acquiring information that will be useful at some undefined later date. The orientation is subject-centered in that the curriculum is split into separate subject matter compartments. Moreover, the motivation for adult learners is internal (i.e., the love for learning is what motivates them to learn) rather than external as with children. External factors include grades, fear of failure, rewards, parental pressure, and peer pressure.

## **Methodology**

### **Description of the Vocational Education and Arabic Teaching Methods Courses**

The Hashemite University started using the Blackboard system as a complimentary teaching method in summer of the year 2003. A training workshop was provided to 25 instructors representing various departments within the university. Currently, the Blackboard system is used by instructors to deliver Web-based instructional environments. The concern

of this study was the “Vocational Education” and the “Arabic Teaching Methods” courses offered by the Department of Curriculum and Instruction at the Hashemite University in the second semester of the academic year 2004-2005. The three sections of the “Vocational Education” course and the two sections of the “Arabic Teaching Methods” course utilized Web-based technology (Blackboard System) along with face-to-face lectures of three class hours per week as the method of delivering instruction. An orientation session on how to use the basic features of Blackboard was given to students at the beginning of the course. These features comprised of announcement page, discussion board, course documents, grade book, syllabus, glossary, and useful links (El-Tigi, & Branch, 1997; Gallagher, 2001). These features were used by instructors and students of the courses as follow:

\* Instructors used the form-based interface to create content folders (e.g., course documents, syllabus), web links, and faculty and student profiles. The instructor created multiple formats of exams to measure student learning including true/false, multiple choice, completion, ordering, and essay.

\* Students used the system to track their progress, access discussion boards and the virtual classroom and chatting tools which facilitated collaboration and communication in the learning environment (instructor-learner, learner-learner, learner-content). The students also accessed supplemental educational content and resources through Blackboard’s customizable academic resources Web tab for discipline-specific news and events, journals, and periodicals. Individual and group assignments were submitted to faculty via Blackboard’s digital drop box.

### **Statement of the Problem**

The different teaching approaches employed by instructors are either andragogy or pedagogy. While andragogy is related to the science and art of teaching adults, pedagogy is related to the science and art of teaching children. Andragogy involve guiding principles that should be incorporated in any instructional setting including traditional and/or Web-based. In today’s instructional environments, conventional teaching methods are being complimented with Web-based instructional technology. In particular, the Hashemite University of Jordan is regarded as the premier in using Web-based learning tools such as the Blackboard system to deliver instruction, complimenting conventional instructional methods. However,

“the use of the Web may require a new commitment to andragogical principles” (Cahoon, 1998; p. 34). To the best of the researchers’ knowledge, no empirical research that specifically investigated whether adult learning principles, named andragogy, are effectively incorporated in courses delivered via the Web has been undertaken in Jordan. Therefore, the purpose of this study was to determine whether adult learning principles, named andragogy, have been incorporated in classes utilizing Web-based instruction as perceived by the Vocational Education and Arabic Teaching methods students.

### **Study Question**

The following research question was formulated to accomplish the purpose of the study:

1. What are the perceptions of the Hashemite University adult students concerning the degree of utilization adult learning principles (Learners need to know, Self-concept of the learners, Prior experience of the learner, Readiness to learn, Orientation and motivation to learn) in a Web-based instructional environment?

### **Objectives of the Study**

The main objective of the study was:

1. To determine the degree of utilization adult learning principles (Learners need to know, Self-concept of the learners, Prior experience of the learner, Readiness to learn, Orientation and motivation to learn) in a Web-based instructional environment as perceived by the Hashemite University adult students?

### **Importance of the Study**

Society is becoming more complex and technologically advanced. To meet the demands of the marketplace, universities are delivering classes utilizing complementary Web-based instructional technology to generate students who are independent and self-directed. However, Web-based classes should be designed around theoretically-based guiding principles which consider teaching and learning for adults is different than teaching children and should therefore be treated differently (Chu, 2002). Moreover, a universal standard or protocol need to be consulted when designing and delivering instruction to assure their quality (Blumenstyk, 1998). The outcome of this study is important for the following reasons:

(a) this study is a potential step toward determining the extent of application of the adult learning principles in the teaching/learning situation, (b) it enables those designing and conducting adult learning to plan more effective learning processes, (c) it can help educators to recognize the effectiveness of their teaching strategies and that adults need different teaching approaches than those used for children, and (d) it provides a prescription for the learning climate, diagnosing of educational needs, the planning process, and for the evaluation of performance, thus increasing effectiveness for learning. Finally, considering the fact that more classes are delivered via the Web, it is important to constantly add to the research to create more effective programs.

### **Delimitations and Limitations**

The limitations and delimitations of this study included the following:

1. The target population of the study was limited to adult students enrolled in the “Vocational Education” and the “Arabic Teaching Methods” courses offered by the Department of Curriculum and Instruction at the Hashemite University for the second semester of the academic year 2004-2005.
2. This study was delimited to the use of a survey instrument as the primary method of gathering data.

### **Definition of Terms**

For the purpose of this study, the following defined terms are required: **Web-based tools (Blackboard):** is a web-based multimedia learning and management system that utilizes asynchronous and synchronous communication tools (Gallagher, 2001).

**Adult Learner:** a university undergraduate student, eighteen years of age or older.

### **Population and Sample**

The population of the study included all the Hashemite University undergraduate students who were enrolled in the “Vocational Education” and the “Arabic Teaching Methods” courses offered by the Department of Curriculum and Instruction in the second semester of the academic year 2004/2005. There were three sections of the “Vocational Education” course with a total number of 225 students and two sections of the “Arabic Teaching Methods” course with a total number of 81 students

resulting in 306 participants. For the purpose of participating in the pilot study, a random sample of 26 students was excluded. The rest of the students (280) made the actual sample for the study.

### **Instrumentation**

The instrument used to collect data in this study was a two-part questionnaire named Online Adult Learning Inventory (OALI) adapted from Colton (2002) and changes were applied to the rating scale (changed from yes/no answer to a Likert-type scale) to provide a more meaningful results. The first part of the questionnaire included five sub-scales related to each adult learning principle. The 28 items for all sub-scales were rated on a Likert-type scale ranged as follow: 1 “Strongly Disagree”, 2 “Disagree”, 3 “Neutral”, 4 “Agree”, and 5 “Strongly Agree”. These sub-scales were adults’ orientation and motivation to learning (5 items), learners need to know (9 items), prior experience of the learner (5 items), readiness to learn (5 items), and self-concept of the learner (4 items). The second part of the questionnaire collected demographic information related to students’ gender, age, undergraduate level, and overall GPA.

### **Validity and Reliability of the Instrument**

The original English version of the OALI was developed through an extensive review of the literature, a Web-based Delphi process, and by a panel of esteemed experts from the field of adult learning, instructional design, and Web-based courseware development. The OALI was shown to have both content and face validity. For indication of reliability, the OALI was tested with 14 university faculty members. Analysis of the field test showed moderate to high inter-rater reliability of .8 to .93.

### **Instrument Translation Process**

To ensure equivalence of meaning of the items and constructs between the Arabic and English versions of the OALI, a rigorous translation process was used that included forward and backward translation, subjective evaluations of the translated items, and pilot testing. The goal of the translation process was to produce an Arabic version of the OALI with items that were equivalent in meaning to the original English version (Lomi, 1992; Sperber, Devellis, & Boehlecke, 1994). One translator (faculty member) bilingual in English and Arabic translated the English version of the OALI into Arabic (forward translation). This translator was

instructed to retain both the form (language) and the meaning of the items as close to the original as possible but to give priority to meaning equivalence. When the Arabic translation was finalized, the OALI was then back-translated (from Arabic to English) by another faculty member, bilingual in English and Arabic.

The back-translated items were then evaluated by a group of three faculties to ensure that the item meanings were equivalent in both the original English versions and the back-translated version. If differences in meaning were found between items, those items were put through the forward and back-translation process again until the faculties were satisfied there was substantial meaning equivalence. The Arabic version of the OALI was then pilot tested with a group of 15 students and 8 faculties to collect feedback about instrument content and usage. The feedback from the students did not lead to any substantive changes. The feedback from the faculties emphasized that the instrument has both face and content validity.

### **Instrument Standardization**

The instrument was pilot tested with a group of 26 students who were enrolled in the “Vocational Education” and the “Arabic Teaching Methods” courses. These students were excluded from the main sample of the study. Changes recommended by the validation panel and those identified as needed during the pilot test were incorporated into the instrument. These changes occurred in the wording of items and in the instructions for completing the instrument. The internal consistency of the instrument was determined using the same group of students used in the pilot study. The calculated coefficient alpha reliability for the five sub-scales was as follow: adult’s orientation and motivation to learning ( $\alpha = .73$ ), learners need to know ( $\alpha = .82$ ), prior experience of the learner ( $\alpha = .85$ ), readiness to learn ( $\alpha = .77$ ), and self-concept of the learner ( $\alpha = .71$ ). These figures suggest that the instrument is suitable to measure the application of adult learning principles in Web-based instructional environments.

### **Data Analysis**

To answer the research question, descriptive statistics were used to compute frequencies, means, percentages, and standard deviations for variables and items of the five sub-scales of adult learning principles. The

SPSS statistical package version 11.5 was employed to carry out these analyses.

### **Data Collection**

During the last two weeks of the second semester of the academic year 2004-2005, the instrument was handed to students in the three sections of the “Vocational Education” course and the two sections of the “Arabic Teaching Methods” course. Data were collected in class from 260 students, with a response rate of 92% (260 out of 280). Twenty-eight of the respondents were males and 72% were females. Sixty-nine were freshmen (25%), 72 sophomores (26%), 78 juniors (28%), and 61 seniors (22%). The average student age was 20 years, ranging from 18 to 24. Students’ overall grade-point average was 2.69, ranging from 2.09 to 3.45.

### **Results of the Study**

#### **Results Pertaining to Principle (1): Learners Need to Know**

The first adult learning principle was about learners need to know why they need to learn something prior to the process of learning. To measure agreement of students with the extent of application of this principle in the Web courses, students were asked to rate their responses on nine items. The mean values and standard deviations for students’ responses to these items are presented in Table 1. According to the table, the overall mean score for all items was 3.69, indicating favorable agreement toward the application of this principle in the Web courses. Items 1, 2, and 3 had the highest mean values (4.06, 3.98, and 3.97 respectively), whereas items 8 and 9 had the lowest mean values (3.40 and 3.46 respectively). The rest of the items mean values were fairly high ranging from 3.48 to 3.70. It is noticeable that six of the nine items had mean values above 3.50.

**Table 1**  
**Means and Standard Deviations for the item of the learners need to know scale (N=260)**

	Item	N	Mean	SD
1.	Information is provided about the skill and technical requirements of the course	260	4.06	.61
2.	At the beginning of each lesson, learners are oriented to the objectives of central focus of that lesson.	258	3.98	.77
3.	At the beginning of each lesson, a summary of the required activities is presented.	260	3.97	.74
4.	Clear expectations are set for each learning unit.	260	3.70	.89
5.	An online syllabus identifies key course activities, assignments, and grading criteria.	260	3.63	.88
6.	Clear expectations are set for how projects or papers to be completed	260	3.52	.87
7.	Clear expectations are set for the course.	258	3.48	.92
8.	Information is provided about the course's intended learning outcomes and benefits.	259	3.46	.91
9.	Models of "best practice" behavior are provided in order to let students know what they are doing compared to know model.	260	3.40	.95
<b>Average</b>		259	3.69	.83

Table 2 presents frequencies and percentages of students' responses to the nine items of their agreement toward the application of the need to know principle in the Web courses. Based on the table, students' highest agreement and strong agreement (around 90%) was on item 1. of all 260 students, 234 agreed or strongly agreed that "information is provided about the skill and technical requirements for the course". Students' next highest agreement and strong agreement (around 84%) was on item 2. Two hundred seventeen students agreed and strongly agreed that "at the beginning of each lesson, learners are oriented to the objectives or central focus of that lesson". Item 3 ranked the third (83%) where 216 students agreed and strongly agreed that "at the beginning of each lesson, a summary of the required activities is presented".

Items 8 and 9 received students' lowest agreement and strong agreement toward the application of the need to know principle in the Web courses. Around 49% of students agreed and strongly agreed that "models of best practice behavior are provided in order to let students know what they are doing compared to a known model". Also, about 46% of students agreed and strongly agreed that "information is provided about the courses intended learning outcomes and benefits". Percentages of students whom were neutral with the nine items were between 7.3 and 37.7.

**Table 2**  
**Frequencies and Percentage of the Adults Need to Know Principle**

	SA		A		N		D		SD	
	F	%	F	%	F	%	F	%	F	%
Item#1	49	18.8	185	71.2	19	7.3	0	0	7	2.7
Item#2	55	21.2	162	62.3	29	11.2	11	4.2	3	1.2
Item#3	51	19.6	165	63.5	31	11.9	11	4.2	2	.8
Item#4	37	14.2	137	52.7	55	21.2	27	10.4	13	6.7
Item#5	32	12.3	135	51.9	61	23.8	28	10.8	4	1.5
Item#6	24	9.2	126	48.5	60	23.1	45	17.4	3	1.2
Item#7	26	10.0	121	46.5	80	30.8	29	11.2	4	1.5
Items#8	32	12.3	95	36.5	98	37.7	31	11.9	4	1.5
Item#9	32	12.3	88	33.8	97	37.3	37	14.1	6	2.3

### Results Pertaining to Principle (2): Self-Concept of the Learner

The second adult learning principle was about the learner self-concept and the degree of its application in the Web courses. Students were asked to rate their responses to four items. Table 3 provides the mean values and standard deviations for students' ratings of these items. According to the table, the overall mean value for all items was 3.48, indicating favorable agreement with the fact that their self-concept is being considered in the Web courses. All four items had almost equal distribution of mean values ranging from 3.43 to 3.55.

**Table 3**  
**Means and Standard Deviations for the items of the Self-Concept of the Learner scale (N=260)**

Item		N	Mean	SD
1.	The instructor provides organizers that allow students to manage study and homework with minimal questions.	260	3.55	1.10
2.	The course is designed to allow students to direct their own learning.	260	3.50	1.15
3.	The instructor provides flexibility in assignments that allow for students to work ahead.	260	3.46	1.22
4.	The instructor encourages and reinforces self-sufficiency through timely feedback.	260	3.43	1.07
Average		260	3.48	1.14

Frequencies and percentages of students' responses to the four items are displayed in table 4. According to the table, students' agreement and strong agreement was almost equally distributed on all four items ranging from 60% to 65%. For example, based on responses to item 1, around 65% of students agreed and strongly agreed that "the instructor provides organizers that allow students to manage study and homework with minimal questions". Item 2 was next in rating where 63% of students agreed and strongly agreed that "the course is designed to allow students to direct their own learning". This shows that the self-concept of students was considered in the Web courses. Moreover, the students' responses to the neutral category ranged from 13.9 to 20.8. This leaves about 15% of students (40) disagree and strongly disagree with the fact that their self-concept have been recognized in the Web courses.

**Table 4**  
**Frequencies and Percentages of the Self-Concept of the Learner Principle**

	SA		A		N		D		SD	
	F	%	F	%	F	%	F	%	F	%
Item#1	42	16.2	125	48.3	42	16.2	33	12.7	17	6.6
Item#2	45	17.4	118	45.6	36	13.9	32	12.4	28	10.8
Item#3	43	16.6	120	46.3	40	15.4	35	13.5	21	8.1
Item#4	27	10.4	128	49.4	54	20.8	30	11.6	20	7.7

### **Results Pertaining to Principle (3): Prior Experience of the Learner**

The third adult learning principle concerned whether prior experience of learners was considered as a rich resource of learning when designing the Web courses. Students were asked to rate their responses to five items. The mean values and standard deviations are presented in Table 5.

According to the table, the overall mean score for all items was 3.53, indicating favorable agreement toward the application of the prior experience of learners in the Web courses. While items 1, 2, and 3 had the highest mean values (4.18, 4.09, and 3.98 respectively), items 4 and 5 had the lowest mean values (2.74 and 2.68 respectively).

**Table 5**  
**Means and Standard Deviations for the Items of the Prior**  
**Experience of the Learner Scale (N=260)**

Item		N	Mean	SD
1.	If students are not familiar with each other, the class is opened with introductions.	259	4.18	.75
2.	Assignments encourage students to share and reflect upon their prior experiences.	259	4.09	.79
3.	Course assignments allow students to incorporate their prior knowledge into their learning.	259	3.98	.80
4.	Guidance is provided to help students incorporate their life experiences into learning.	259	2.74	1.11
5.	Peer critiques or mentoring is encouraged and facilitated.	259	2.68	1.07
<b>Average</b>		<b>259</b>	<b>3.53</b>	<b>.90</b>

Frequencies and percentages of students' responses to the five items are presented in Table 6. Based on the table, students' highest agreement and strong agreement (80%) was on item 1. of all 260 students, 208 agreed or strongly agreed that 'if students are not familiar with each other, the class is opened with introductions'. Students' next highest agreement and strong agreement (around 76%) was on item 2. one hundred ninety-six students agreed or strongly agreed that "assignments encourage students to share and reflect upon their prior experiences". Item 3 ranked the third where around 71% (185) of students agreed and strongly agreed that "course assignments allow students to incorporate their prior knowledge into their learning".

Items 4 and 5 received students' lowest agreement and strong agreement toward the degree of application of this principle into the Web courses. Around 21% of students agreed and strongly agreed that "guidance is provided to help students incorporate their life experiences into learning". A close percentage of students (19%) agreed and strongly agreed that "peer critiques or mentoring is encouraged and facilitated". Percentages of students who were neutral in their responses of the five items ranged from 14.3 to 22.8.

**Table 6**  
**Frequencies and Percentage of the Prior Experience of**  
**the Learner Principle**

	SA		A		N		D		SD	
	F	%	F	%	F	%	F	%	F	%
Item#1	47	18.1	161	62.2	37	14.3	12	4.6	2	.8
Item#2	49	18.9	147	56.8	48	18.5	13	5.0	2	.8
Item#3	47	18.1	138	53.3	59	22.8	13	5.0	2	.8
Item4	39	15.1	15	5.8	49	18.9	152	58.7	4	1.5
Item#5	34	13.1	16	6.2	45	17.4	160	61.8	3	1.2

#### Results Pertaining to Principle (4): Learners' Readiness to Learn

The fourth adult learning principle was related to whether adults are ready to learn through alternate ways of thinking in a Web-based learning environment. Students were asked to rate their responses to five items. Table 7 displays the mean values and standard deviations for students' ratings of these items. According to the table, the overall mean value for all items was 2.81, indicating that students perceive they are not ready enough to learn in a Web-based environment. While item 1 had the highest mean value (3.52), item 5 had the lowest mean (2.31). The rest of the items (2, 3, and 4) had mean values of 2.88, 2.68, and 2.66 respectively.

**Table 7**  
**Means and Standard Deviations for the Items of the Readiness to**  
**Learn Scale (N=260)**

Item		N	Mean	SD
1.	The instructor uses common language characteristics between old and new models or concepts and induces new jargon appropriately.	260	3.52	1.01
2.	Students are encouraged to share with other students their derivation of meaning and their progress through discussion postings, reflection papers that are posted, or e-mail.	260	2.88	.87
3.	Orientation activities are provided at the beginning of the course that allow learners to develop the skills necessary to complete the course (e.g., "introduce yourself to the discussion forum", "send me e-mail saying you were able to log on").	260	2.68	1.10
4.	The instructor of the course encourages all students to post responses to questions, read other comments, and reflect. (Threaded discussions allow students to see and reflect on each other's responses in comparison to their own).	260	2.66	1.05
5.	The course provides a conceptual framework that helps learners to develop new conceptual frameworks or mental models.	260	2.31	1.06
Average		260	2.81	1.02

Frequencies and percentages of students' responses to the five items are presented in Table 8. Based on the table, of all 260 students, 152 (around 58%) reported that the language used in the Web courses were appropriate and helped their learning. Eighty-one students (around 31%) reported that they were encouraged by the instructor to share their progress through the features of the Blackboard. Another 50 students (around 19%) reported that the orientation session helped in skill development. Finally, 31 students (around 12%) reported that the web-course helped develop their mental models. It is noticeable that the readiness of students to use the Web technology is still in its beginning stages.

**Table 8**  
**Frequencies and Percentages of the Readiness to Learn Principle**

	SA		A		N		D		SD	
	F	%	F	%	F	%	F	%	F	%
Item#1	24	9.2	128	49.2	55	21.2	34	13.1	19	7.3
Item#2	15	5.8	66	25.4	69	26.5	92	35.4	18	6.9
Item#3	34	13.1	16	6.2	45	17.3	161	61.9	3	1.2
Item#4	36	13.8	14	5.4	40	15.4	165	63.5	5	1.9
Item#5	3	1.2	28	10.8	49	18.8	147	56.5	33	12.7

### **Results Pertaining to Principle (5): Adults Orientation and Motivation to Learning**

The fifth adult learning principle was related to students' orientation to learning (problem-centered) and their motivation to learn in a Web-based learning environment. Students were asked to rate their responses to five items. The mean values and standard deviations for students' responses to these items are presented in Table 9.

According to the table, the overall mean score for all items was 3.64, indicating moderate agreement that orientation and motivation of students toward learning was incorporated in the Web-based learning environment. While items 1 and 2 had the highest mean values (3.80 and 3.67 respectively), item 5 had the lowest mean value (3.54).

**Table 9**  
**Means and Standard Deviations for the Items of the Adults**  
**Orientation and Motivation to Learning Scale (N=260)**

Item		N	Mean	SA
1.	Assignments incorporate activities to which students can relate; to real situations or events.	260	3.80	.88
2.	Students are encouraged to apply their life and work experiences to learning.	260	3.67	.92
3.	Opportunities are included for solving problems in groups.	260	3.62	.94
4.	Content and Theory are presented in a practice-oriented context.	260	3.58	.90
5.	Assignments reflect the maturity level of adult learners.	260	3.54	1.02
Average		260	3.64	.92

Frequencies and percentages of students' responses to the five items are presented in Table 10. Based on the table, students' highest agreement and strong agreement (around 69%) was on item 1. of all 260 students, 179 agreed or strongly agreed that "assignments incorporate activities to which students can relate, to real situations or events". Students next highest agreement was on items 2 and 3. around 67% of students agreed and strongly agreed that "opportunities are included for solving problems in groups" and "students are encouraged to apply their life and work experiences to learning". The rest of the items had the same percentage. Overall, students' responses to the five items indicate that the Web-based courses were adequately incorporating the orientation and motivation of students to learning.

**Table 10**  
**Frequencies and Percentages of the Adults Orientation and**  
**Motivation to Learning Principle**

	SA		A		N		D		SD	
	F	%	F	%	F	%	F	%	F	%
Item#1	54	20.8	125	48.1	59	22.7	20	7.7	2	.8
Item#2	45	17.3	130	50.0	42	16.2	27	10.4	16	6.2
Item#3	39	15.0	136	52.3	56	21.5	19	7.3	10	3.8
Item#4	48	18.5	123	47.3	37	19.2	26	10.0	26	10.0
Item#5	50	19.2	121	46.5	40	15.4	28	10.8	21	8.1

## Discussion and Conclusions

This study was conducted to determine the extent to which adult learning principles, named andragogy, have been integrated in university vocational courses utilizing Web-based instructional technology from a student perspective. Specifically, two courses (the Vocational Education and Arabic Teaching methods) were selected because they were utilizing Blackboard as an e-learning tool complementing traditional Instruction. The andragogical model was proposed by Knowles (1973, Knowles, 1990) and later adapted and modified by Colton (2002) to specifically relate to Web-based learning environments. The adapted model included five principles: (a) adults need to know, (b) self-concept of the learner, (c) prior experience of the learner, (d) readiness to learn, and (e) orientation and motivation to learning. After the process of instrument translation, standardization, and distribution, data were collected from 260 students with a response rate of 92%. Descriptive statistics were used to analyze the collected data. In what follows, we discuss the application of the five principles in light of the results presented in the previous section.

## The Major Findings of the Study

Students in the “Vocational Education” and “Arabic Teaching Methods” courses were asked to rate their responses to 28 items that measured their perceptions toward the application of the five andragogical principles in their Web-based learning environments. Results of the analysis of students’ responses indicated the following:

1. The students perceived that their need to know what learning will occur, how learning will be conducted, and why learning is important was provided to them by the faculty members teaching the Web-courses. The overall mean of the students responding to this dimension reflected a very positive response in the “agree to strongly agree” range with an overall mean of 3.69. Moreover, high percentage of students (83-90%) reported positive agreement that instructors provided them with an orientation session at the beginning of each lesson specifying the objectives, activities, skills, and technical requirements for the course. This major finding can be looked at as an evidence of the effectiveness of faculty members in the Department of Curriculum and Instruction in providing students with clear expectations about the course direction. Furthermore, faculty members were effective in providing students with an online syllabus that clearly specified course assignments, activities, projects, and grading.

Also, students were instructed of the clear benefits and outcomes of the courses.

2. The students perceived that the faculty members established a structure for self-direction (students were responsible for their own learning and decisions) in the Web courses. An overall mean of 3.48 indicated a moderate-favorable agreement of students to this dimension. About 65% of students perceived that they were provided with the opportunity to direct their own learning. This was accomplished by instructor-provided organizers which allowed students to manage study and homework with minimal questions. Moreover, students were allowed flexibility in assignments and were provided with timely feedback that allowed sufficiency to work ahead.

3. The students perceived that their prior life experiences and knowledge were considered by faculty members teaching the Web courses. The overall mean of the students responding to this dimension reflected a very positive response in the “agree to strongly agree” range ( $M = 3.53$ ). The faculty members were effective in providing students with assignments which encouraged them to share and reflect upon their prior experiences and how to incorporate prior knowledge into new learning. Moreover, between 76-80% of students agreed that faculty members were effective in familiarizing students with each other and in allowing students to share and reflect upon their prior experiences.

4. The students perceived that they are quite uncertain about their readiness to change their mental habits and biases about learning in Web-based learning environments. The overall mean (2.81) of the students responding to this dimension was in between the high end of the “disagree” to “uncertain” range. Even though the language used was appropriate (58% of responses), the students perceived that the orientation sessions provided by the beginning of the semester was enough (91%). This leaves about 81% of students somewhat dissatisfied with such sessions. These students may require hands-on, continuous, and practical application of learning the features of the Blackboard system as they progress in the course. Another 88% of students believed that their mental model and bias about the Web-based learning environments have not changed yet. This notion is justified given the new adventure students are exposed to in such Web environments. It is well established in the literature that technology-associated anxiety plays an important factor in hindering students from changing their stereotypes about the types of technology used (Holzinger, 1992; Kernan & Howard, 1990).

5. The students perceived that their orientation to learning where they apply what is learned today to real situations have been considered by the faculty members in the Web courses. Moreover, students were internally motivated to learn in Web-based environments. The overall mean of the students responding to this dimension reflected a very positive response in the “agree to strongly agree” range ( $M = 3.64$ ). For example, faculties incorporated activities in assignments to which students can relate, to real situations or events; content is presented in a practice-oriented context, and students provided the opportunity to solve problems in groups (69% of students).

To sum up, the Hashemite University is effectively incorporating adult learning principles in the Web-based learning environments. However, more attention need to be given to the anxiety associated with technology usage. Such anxiety can be lowered by providing students with ongoing sessions about the Blackboard system and how it can incorporated into their learning.

### Conclusions

The major findings of this study showed that the students perceive the five andragogy principles to be present in their Web courses. The students also perceived that the faculty members were effectively incorporating the five principles in the Web courses. The agreement lends support to the argument that the principles of andragogy proposed by Knowles (1973, Knowles, 1990) can be directly applied to evaluate Web courses from a student perspective. Moreover, these results suggest a conceptual framework for practitioners that self-directed learning can be promoted in Web-based learning environments by helping students focus on assuming responsibility for his/her learning process. This is essentially important for faculty members who have the responsibility of training students in this area. It also provided that from a theoretical standpoint, some uniform guidelines can be set in place for future evaluation and development of Web courses. The study offers the following recommendations for action:

1. More studies on andragogy principles must be encouraged at the university level to help evaluate the effectiveness of Web-based courses in order to meet the needs of the diverse population of adults.
2. New instruments need to be developed to measure the application of adult learning principles which in turn can be used by the university administrators to accurately measure the success of their programs.
3. This study provides insights to the critical need of training faculty

members on the proper methods of incorporating adult learning principles when developing and evaluating Web courses.

4. Students need to be prepared for learning in Web-based learning environments. As seen in the results, students were uncertain about their readiness to learn. Workshops and orientation sessions prior to class participation is encouraged.

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