

Exploring the Potential of Mobile Learning Use Among Faculty Members

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Abstract—The purpose of this study was to investigate faculty members' attitudes toward mobile learning in King Saud University. The sample of the study consisted of 362 faculty members from King Saud University in Saudi Arabia during the academic year 2012-2013. A questionnaire consisted of 37 items was developed to measure the attitudes. The results showed that the attitudes of faculty members towards mobile learning are positive and there are statistically significant differences attributed to gender in favor of (female faculty members), academic rank in favor of (instructor), and academic experience in favor of (21 years of experience and more).

Index Terms—Attitudes, Faculty, Mobile Learning, University.

I. INTRODUCTION

In the light of developments subsequent to information age, educators seek to keep abreast of these developments through attempts and intensive efforts to transform the traditional learning environment directed by the teacher to a multiple sources learning environment, and due to the development of information and communication technology and its growing remarkable potentials, its employment in support of the educational process, and to develop long-term strategies for its integration in education, has become a fundamental goal of the contemporary educational reform.

The term m-learning refers to learning using mobile technologies, including but not limited to computers, mobile players, Personal Digital Pads, MP3, laptops and mobile phones. Mobile learning focuses on the learner to be mobile, and interacts with mobile technologies, and reflects a focus on how society and its institutions absorb and support mobile devices, which are growing.

With the growing of communication revolution, mobile devices such as mobile phones have become accessible for students and professors in schools, and universities. Common feature is that all these devices are easy to use and contains the ability to communicate through the Internet or a network of mobile operator; also the storage and software capacities for these devices allow reception of different programs. And we may exploit these advantages by developing files containing educational programs can be read, monitored, and traced by mobile phone, it can reach a large number of students at anytime and anywhere and then being able to manage part of the educational process with ease to thousands of students and trainees and the cost is very affordable for students.

One of the leading projects for m-learning in the Arab region was the Arab Open University in Bahrain learning project by the mobile phone (Mobile learning) during the academic semester (October 2008). Another project was The King Saud University project conducted by Dr. Mohammad Alharthi, for using SMS in university teaching. A project conducted by Manarat Educational Consultancy, MEC in the provision of m-learning service by which sending and downloading files and applied materials lessons and exams on a mobile phone for these service clients.

A. Mobile Learning in King Saud University

Recently King Saud University in Saudi Arabia began plans to employ mobile devices such as mobile phone and SMS service to take advantage of its applications to serve its educational programs, within the framework of the distance learning program, to ensure the provision of programs for distance education via cell phone. The employment of this service represents a new phase of the stages of distance education, which in turn will open up broad prospects for education for large segments of society, specially the educational system, and this has been done through e-learning, as well as the use of education via mobile phone, which would be a major shift that will raise the level of e-learning.

One of the most common applications used in the learning process was messaging. Therefore a Message Center was developed to provide a mechanism that allows all users the ability to send SMS for all university employees, or email, it supports interactive services to groups with an option that allows jointly or canceled at the request of the user. The Center has a system alerts advanced users, post messages to raise awareness and education, send administrative and regulatory decisions of the university, in addition to send congratulations in national, religious and social events. The user is enabled see the status of each transmission sent by a supervisor. A window showing the reason for the rejection in case a supervisor refused to send the message [1].

The system allows m-learning to provide educational services to the community through smart phones, tablet devices such as a database of students' names, dates of the attendees, and content of the lectures. In addition, the learning management system helps students' access scientific material, and communicates with the University anywhere, anytime [2]. The university has released the so-called system Tawasol, which is still in the experimental stage, which allows the subscriber to send SMS messages or e-mail from freelancers. Statistics indicate that the number of online reach (442), the total number of

messages (23497618), the number of messages sent (23383237), the number of users (11122), the number of groups, (14 654), the number of recipients (656.460) [1].

B. Characteristics of Mobile Learning

The devices used in m-learning, such as mobile phones (Cell Phones), and smart devices (Smart Phones), and personal digital assistants (PDAs), and iPod, has the advantage of being portable and allows truly anywhere anytime personalized learning [3], from one place to another, these devices are used to transfer the educational content of the educational process, by the use of tools, such as audio and video players, etc. Which is characterized by its proximity to wireless application protocols and Wi-Fi that enable learners to link with the Internet anytime, anywhere [4].

C. Mobility of Learner

The e-learning, which uses fixed computers requires the learners learn in a specific place and time to connect the computer on the Internet, but in the case of m-learning is different, learning may happen in anywhere and anytime, where the use of mobile technology devices in education as opposed to fixed heavy weight computers. This is one of the advantages of m-learning, as it is flexible, encourages individual student learning, and provide him with constant access to educational materials and activities. These merits keep the learner immersed in continuing educational activities, and increase the productivity and effectiveness rate [5]. The pros of m-learning is manifested in its ability to promote collaborative learning among students, since it help students enjoy a sense of ownership and monopoly in learning and innovation in educational content by active participation in cooperative interactive social activities available on mobile technology devices [6].

II. LITERATURE REVIEW

For the sake of integrating any educational innovations in the teaching-learning process successfully, we must conduct extensive studies for all related issues, and try to answer all its questions. Therefore, the introduction of m-learning within higher education should not be limited to equipment or educational resources, but must be accompanied by a focus on the human aspects of the mission, and on top of them the attitudes of learners and teachers about m-learning. While reviewing the literature some previous studies related to the subject were found. These studies were viewed as follows: The results of a project conducted in King Saud University by Dr. Mohammad Alharthi, about using SMS in university teaching, showed that learners' attitudes were positive ones. The project recommended that more support and upgrade of programs embodied in the e-learning management systems to support mobile learning, and more care using mobile technologies in education due to the large spread between the educated and especially the new generation of them [7].

Medical teachers and learners have been investigated how they are using m-learning devices such as the iPhone. Results showed that portability, flexibility, access to multimedia and look up for information were the main benefits they attained. Both medical students and physicians believed that the use of m-learning in medical education and practice will augment in the future [8].

The reasons behind the use of m-learning are a combination of factors: Mobile phone is the most commonly used technological devices in our hands, a growing of studies and reports indicated that keys, wallets, and mobile phones are among the more stuff we carry [9].

College instructors' and students' attitudes were examined toward the use of mobile devices (laptops and cell phone), for non-academic purposes, during lectures. Findings implied that some participants valued mobile devices as an acceptable and useful way; others found it unacceptable way and disturbing for both [10].

Teachers' perceptions toward m-learning in Cyprus were investigated. The findings entailed that teachers expressed above medium levels of perception toward m-learning. In addition, male teachers' perception of m-learning technologies was fairly higher than female teachers [11].

M-learning perceptions and m-learning levels of the prospective teachers were explored with regard to their departments and gender at a university in Turkish Republic of Northern Cyprus. The results showed that there was no significant difference according to teachers' department and gender. In addition, teachers' perceptions levels were low [12].

It is clear from the foregoing that the majority of previous studies indicated a positive change in faculty attitudes toward m-learning. In addition, there are a limited number of published studies in Arab countries especially with regard to faculty attitudes toward m-learning in university level.

A. Problem of the Study

Within this framework, which represents the orientation and transformation of King Saud University toward the use and integration of m-learning applications in learning, teaching and educational uses? This study came to reveal what kind of attitudes faculty members have toward m-learning. Since faculty members represent the driving force on most technological innovations within their universities. They play a major role in minds shift and shaping public opinions within their universities and societies. Therefore, this study seeks to answer the following questions:

- What are the attitudes of faculty members at King Saud University toward m-learning?
- Are there any statistical significant differences at the level of significance ($0.05 \geq \alpha$) in faculty members attitudes at King Saud University towards m-learning with regard to their: Gender, academic rank, and academic experience?

B. Procedural Definitions of the Study

M-learning: A learning system that uses cell phones and students portable website used by King Saud University in teaching various courses.

Attitudes: Represent the state of mental preparedness and nervous system through experience, a direct response of individuals towards all things and situations that relate to them [13]. This is measured by the degree obtained by a faculty member on the scale to measure faculty attitudes toward m-learning within the questionnaire of the study.

III. METHODOLOGY OF THE STUDY

A descriptive survey methodology was employed for conducting the study. The interpretation of research results largely depend on the time of the study and the sample size, this type of research is more than just data, it involves that the researcher must discuss data to reach a convenient access to interpret, and discover the meanings and relationships within the data.

A. Population and Sample of the Study

Population of the study consisted of all the faculty members at King Saud University in Saudi Arabia during the academic year 2012/2013, totaling (6000). All faculty members who were teaching were chosen as a sample for the study. A questionnaire was distributed to faculty manually and electronically via their e-mail. After collecting questionnaires, only (362) were ready for analysis.

TABLE I.
DISTRIBUTION OF FACULTY ACCORDING TO GENDER,
ACADEMIC RANK, AND EXPERIENCE

Variables	Interval of Variables	Number	Percent
Gender	Male	52	14.4%
	Female	310	85.6%
	Total	362	100%
Academic rank	Professor	42	11.6%
	Associate Professor	99	27.3%
	Assistant Professor	97	26.8%
	Instructor	124	34.3%
	Total	362	100%
Experience	Less than 5 years	105	29.0%
	5 to 10 years	97	26.8%
	11 to 15 years	69	19.1%
	16 to 20 years	53	14.6%
	More than 21 years	38	10.5%
	Total	362	100%

B. Instrument of the Study

A questionnaire was developed to measure faculty members attitudes towards the concept of m-learning through a review of the theoretical literature and previous studies that addressed the issue of the concept of m-learning. A four-point Likert scale ranging from strongly agrees to disagree was used to measure the degree of awareness of faculty.

C. Validity

To verify the content validity of the questionnaire it was presented to (9) experts in the field of curriculum and instruction, and educational technology in the Hashemite Kingdom of Jordan. Also, to determine the suitability and coverage of items for measuring attitudes towards the concept of m-learning, and the extent of affiliation of items to the dimensions used in the study. In addition, to achieve the clarity and integrity of items language, as well as mention of any proposed amendments, proposed items deemed necessary, and delete unnecessary items. Proposed amendments made by the experts in their recommendations were added, such as re-wording and delete of some items because of redundancy. In light of the amendments, the instrument consisted in its final draft

of (37) items to measure attitudes, distributed over one dimension.

D. Reliability

Cronbach's alpha coefficient was calculated to measure the internal consistency of the dimension, which was (0.93). It is obvious that this high value suitable for study purposes. Additionally, an item analysis was conducted to double check if items were highly correlated. The dimension consisted of negative items :(1 12 21 29 30 37) and the rest were positive items.

The negative wording of items was taken into account in the questionnaire when debugging. Positive items direction takes the mark as follows: strongly agree (4), agree (3), disagree (2), strongly disagree (1). While negative items direction as follows: strongly agree (1), agree (2), disagree (3), strongly disagree (4). For the purposes of the current study, the researchers adopted the views of experts in this field to measure faculty members' attitudes towards the concept of m-learning as follows:

The upper limit of alternatives for the scale in the instrument is (4), and a minimum of alternatives is (1). By subtracting the minimum upper limit equal to (3), and then dividing the difference between the two extremes on three levels, as shown in the following equation: $3 \div 3$ levels (high, medium, low) = 1 and it will be: Minimum limit = $1 + 1 = 2$, average limit = $2 + 1 = 3$, and the upper limit = 3 or more. Thus, the weights for items as follows:

- Items that its means averaging between (3.01- 4.00) means that the attitudes of faculty members to the concept of m-learning is high.
- Items that its means averaging (2.01-3.00) means that the attitudes of faculty members to the concept of m-learning is medium.
- Items that its means averaging (1.00-2.00) means that the attitudes of faculty members to the concept of m-learning is low.

E. Variables of the Study

First: Independent variables: Gender: With two levels: Male, Female. Academic rank with four Levels: Professor, Associate Professor, Assistant Professor, Instructor. Experience: With five levels: Less of 5 years, 5 to 10 years, 11 to 15 years, 16 to 20 years, more than 21 years. Second: the dependent variables: the attitudes of faculty members towards the concept of m-learning measured through participants responses on the specified scale in the questionnaire.

IV. RESULTS

The results for the first research question: To answer the first research question, means, standard deviations, and ranking for responses for the attitudes of faculty in general were calculated, and for the dimension as a whole. Table (2) shows the attitudes of faculty toward the concept of m-learning.

Table (2) shows that the attitudes of the faculty members towards m-learning for items of on the dimension of attitudes were all within the high degree, but some items were within the medium degree. The item "I think that m-learning provides diverse educational means and methods for delivering information to the student" was ranked first in terms of attitudes with a mean (3.46), a standard devia-

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TABLE II.
MEANS, STANDARD DEVIATIONS, AND RANKING FOR FACULTY ATTITUDES AND THE TOTAL SCORE

No.	Items	Means	St. D	Ranking	Degree
1	I think that m-learning increases my educational duties	2.23	0.96	35	medium
2	I think that m-learning can assess students individually.	3.17	0.88	17	high
3	I think that m-learning provides me with ways and means of multiple evaluation.	3.18	0.90	16	high
4	I think that m-learning helps me to achieve my educational goals more effectively	3.13	0.86	22	high
5	I think that m-learning makes my educational role more flexible.	3.37	0.77	7	high
6	I think that m-learning requires me to develop my teaching skills.	3.39	0.82	6	high
7	I think that m-learning strengthens my capacity as a teacher.	3.14	0.90	21	high
8	I think that m-learning enables me to deliver feedback to the student in multiple formats.	3.43	0.78	2	high
9	I think that m-learning provides educational opportunities to meet the needs of different students.	3.25	0.83	12	high
10	I think that m-learning provides diverse educational means and methods for delivering information to the student.	3.46	0.71	1	high
11	I think that m-learning can follow each student's performance first hand.	3.25	0.80	13	high
12	I see that evaluation in the regular education is more effective and accurate than m-learning.	2.07	1.01	36	medium
13	I always make sure to evaluate e-learning methods to determine the suitability of the educational objectives.	3.27	0.75	11	high
14	I think that m-learning helps the student to improve his knowledge of digital skills.	3.43	0.77	3	high
15	I think that m-learning helps the student to get to know his skills and his own abilities.	3.35	0.71	9	high
16	I think that m-learning helps to raise the morale of the learner and appreciation for himself and his self-confidence.	3.35	0.75	8	high
17	I think that m-learning helps students to focus for longer periods.	3.09	0.90	24	high
18	I think that m-learning helps students to identify weaknesses that need to be developed.	3.07	0.88	25	high
19	I think that m-learning helps students to self-conclusion based on their own experiences.	3.17	0.79	18	high
20	I think that m-learning makes students responsible for his own learning.	3.40	0.74	5	high
21	I think that m-learning reduces the student's ability to dialogue and discussion.	2.06	1.03	37	medium
22	I think that students are more active in m-learning.	3.04	0.98	26	high
23	I think that m-learning offers students freedom to search for information.	3.41	0.64	4	high
24	I think that m-learning develops the student's ability to follow-up and well-absorption.	3.19	0.81	15	high
25	I think that m-learning helps students for good preparation for educational materials.	3.10	0.85	23	high
26	I think that m-learning enhances linking the process of learning activities of daily life more than the normal learning.	3.02	0.82	27	high
27	I think that m-learning facilitate managing the learning process between students and their teachers and educational resources more than normal education.	3.16	0.84	19	high
28	I think that the learning environment in the m-learning is more interesting than the normal learning.	3.31	0.73	10	high
29	I think that m-learning is inconsistent with the formal learning.	2.71	1.04	31	medium
30	I think that m-learning does not take into account ethical and privacy issues for students compared to the normal learning.	2.43	1.10	34	medium
31	I think that m-learning is a student-centered learning more than normal learning.	3.14	0.77	20	high
32	I think that m-learning is centered on educational content more than normal learning.	2.96	0.87	28	medium
33	I think that m-learning is centered on assessment methods more than normal learning.	2.80	0.87	30	medium
34	I think that m-learning is centered on issues related to community more than normal learning.	2.53	1.03	33	medium
35	I think that m-learning makes the student more actively engaged in the learning process, compared to the normal learning.	3.19	0.82	14	high
36	I think that m-learning fosters creativity of the student more than normal learning.	2.94	0.90	29	medium
37	I think that the role of teacher in m-learning and normal learning is the same.	2.59	1.12	32	medium
Total		3.05	0.44		high

tion (0.71), and a high degree. The item “I think that m-learning enables me to deliver feedback to the student in multiple formats” was ranked second with a mean (3.43), a standard deviation (0.78), and a high degree. While the item “I think that m-learning reduces the student’s ability to dialogue and discussion” came in the last place with a mean (2.06), standard deviation (1.03), and a medium degree. The item “I see that evaluation in the regular education is more effective and accurate than m-learning” ranked before the last one with a mean (2.07), a standard deviation (1.01), and a medium degree. Reviewing the scores within table (2) showed high degree of attitudes by the faculty members at King Saud University.

The results for the second research question: Are there any statistical significant differences at the level of significance ($0.05 \geq \alpha$) in faculty members attitudes at King Saud towards m-learning with regard to their: Gender, academic rank, and academic experience?

To answer this question and an independent sample t-test was performed to examine the significance of any differences between the means with regard to faculty gender. In addition, a one-way analysis of variance (ANOVA) was conducted to find any statistically significant differences in mean scores between the faculty with regard to their academic rank and experience, and Tukey test for post comparisons. The following is a presentation of the results by each variable separately.

A. Gender of faculty

To determine any significant differences between the mean scores of faculty estimates to their attitudes toward m-learning, means, standard deviations of the sample estimates with regard to gender (male, female), were calculated. In addition, an independent samples t-test was performed to test the significance of any difference between the means. The results were as shown in the Table (3).

Table (3) implies that means scores indicate that there are differences in faculty estimates in their attitudes with regard to gender (male, female). The value of calculated t was (2.389) and the level of significance was (0.017), and its statistically significant at the level of (at $p \leq 0.05$), the differences were in favor of female faculty as shown in table (3).

B. Academic rank of faculty

To determine any significant differences between the mean estimates of faculty of their attitudes toward m-learning, means and standard deviations for faculty estimates with regard to their academic rank (Professor, Associate Professor, Assistant Professor, instructor) were calculated, and the results were as shown in (Table 4).

Table (4) indicates that there are differences in means scores of the faculty estimates in their attitudes toward m-learning with regard to their academic rank. To determine any significant differences between the mean estimates of faculty of their attitudes toward m-learning with regard to their academic rank (Professor, Associate Professor, Assistant Professor, instructor) a One way analysis of variance (ANOVA), was performed. The results were as shown in (Table 5).

Results in table (5) indicated that there were statistical significant differences for faculty estimates in their attitudes with regard to their academic rank, the value of cal-

culated F was (4.078), and level of significant was (0.007), and its statistically significant at the level of (at $p \leq 0.05$). The Tukey test for post-hoc comparisons was used to determine where the differences in means lie in terms of faculty academic rank. The results showed that there were statistical differences between professors and instructors in their attitudes toward m-learning, the differences were in favor of instructors.

C. Experience of faculty

To determine any statistical significant differences between the means of faculty estimates of their attitudes toward m-learning, means and standard deviation were calculated for faculty estimates with regard to their experience (less than 5 years, 5-10 years, 11-15 years, 16-20 years, more than 21 years), and the results were as shown in table (6).

Means scores in table (6) showed that indicated that there were statistical significant differences for faculty estimates in their attitudes with regard to their experience. A One way analysis of variance (ANOVA) was performed to know the statistical significant level in means differences. The results are shown in table (7).

TABLE III.
RESULTS OF T-TEST FOR FACULTY’S ATTITUDES TOWARD M-LEARNING WITH REGARD TO THEIR GENDER

Gender	Number	Means	St. D	t	Df	Sig.
Male	52	2.96	0.44	2.389	360	0.017
Female	310	3.12	0.46			

TABLE IV.
MEANS, STANDARD DEVIATION FOR FACULTY ATTITUDES WITH REGARD TO THEIR ACADEMIC RANK

Academic rank	Number	Means	St. D
Professor	42	2.93	0.32
Associate professor	99	3.13	0.41
Assistant professor	97	3.03	0.56
Instructor	124	3.18	0.43

TABLE V.
RESULTS OF ONE WAY ANALYSIS OF VARIANCE (ANOVA) FOR FACULTY ATTITUDES WITH REGARD TO THEIR ACADEMIC RANK

Difference of means	Sum of squares	Df	Mean square	F	P
Between groups	2.503	3	0.834	4.078	0.007
Within groups	73.260	358	0.205		
Total	75.763	361			

TABLE VI.
MEANS, STANDARD DEVIATION FOR FACULTY ATTITUDES WITH REGARD TO THEIR EXPERIENCE

Experience	Number	Means	St. D
Less than 5 years	105	3.23	0.43
5-10 years	97	3.08	0.47
11-15 years	69	3.08	0.36
16-20 years	53	3.11	0.39
More than 21 years	38	2.77	0.58

TABLE VII.
RESULTS OF ONE WAY ANALYSIS OF VARIANCE (ANOVA)
FOR FACULTY ATTITUDES WITH REGARD TO THEIR
EXPERIENCE

Difference of means	Sum of squares	Df	Mean square	F	P
Between groups	6.122	4	1.530	7.845	0.000
Within groups	69.641	357	0.195		
Total	75.763	361			

Results in table (7) indicated that there were statistical significant differences for faculty estimates in their attitudes with regard to their experience, the value of calculated F was (7.845), and level of significant was (0.000), and its statistically significant at the level of (at $p \leq 0.05$). The Tukey test for post-hoc comparisons was used to determine where the differences in means lie in terms of faculty experience. The results showed that there were statistical differences in attitudes of faculty with more 21 years of experience, and faculty with less than 21 years of experience (less than 5 years, 5-10 years, 11-15 years, and 16-20 years), the differences were in favor of faculty with more than 21 years of experience.

V. DISCUSSION OF RESULTS

Discussion for the results of the first research question which stated: What are the attitudes of faculty members at King Saud University toward m-learning?

The results showed that the attitudes of faculty members toward m-learning were high. These findings are corresponding with the findings by [8], in their study, which indicated that the attitudes of the study sample toward m-learning were high, especially when it comes to future use of m-learning in medical education. These finding on our current study can be attributed to the fact that since the degree of awareness of faculty members therefore, this was manifested in their positive attitudes toward m-learning since their apparent view of the importance of this concept and its advantages and characteristics of the educational process. The researchers may attribute that to the revenue benefits that accrue to the faculty member through m-learning. Since these large returns benefit the educational environment with all its components, the faculty member and the student, and the buildings and their contents, which may reduce the use of, so came the attitudes of faculty members on mobile learning is high. In addition, the findings of the current study contradicted with the findings reached by [12], that teachers' perceptions levels were low toward m-learning.

Discussion for the results of the second research question which stated: Are there any statistical significant differences at the level of significance ($0.05 \geq \alpha$) in faculty members attitudes at King Saud University towards m-learning with regard to their: Gender, academic rank, and academic experience?

The results indicated that there were statistically significant differences in faculty attitudes toward m-learning with regard to gender and in favor of female. Females seem to use the technology more competently than the males, thus that affects their perceptions. The researchers may attributed that to the fact that female faculty were represented more in the sample of the study. These findings contradicted with what [11], found in

their study in Cyprus that male teachers' perception of m-learning technologies was comparatively higher than female teachers. In addition, the findings of the current study contradicted with the findings by [12], which indicated that there were no statistical significant differences according to teachers' gender. And contradicted with several researchers like [14], who believed that males use mobile technologies such as SMS, MMS, electronic mail, and the GPRS more than females.

The results of the study showed that there were differences in attitudes between faculty members who hold the rank of Professor and faculty members who hold the rank of instructor only, these differences were in favor of instructors. In addition, there differences in attitudes between faculty members, who have an experience of 21 years and more, and faculty members who are less than 21 years of experience (less than 5, 5-10, 11-15, and 16-20 years), these differences were in favor of faculty members who have a 21 years of experience and more. The researchers may attribute that to the fact the experience in teaching for a faculty may affect in his attitudes. While m-learning is one of the modern methods, still faculty members inclination toward the use of this technique is distinct, as a faculty member is aware of the benefits gained as a result of using m-learning in the learning process, especially since experience is an important factor in the process of shaping the attitudes and perceptions towards the use of m-learning.

VI. CONCLUSION

The integration of new technology programs in higher education institutions has become inevitable. But the success or failure of m-learning is determined largely on the degree of enthusiasm for optimal use of the new technology on the part of faculty members. Faculty members play an important role in using and teaching of modern technologies in m-learning programs, and for the success of the programs, emphasis on quality, and efficiency and effectiveness, we must overcome all the obstacles that stand in front of those who teach in these programs.

Therefore, there should be frameworks available that make higher education institutions able to meet the needs of m-learning, through satisfying the needs of prospective learners through balanced techniques to develop technology and the human element.

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