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The Implementation of Self-Determination Theory on the Opportunities and Challenges for Blended e-Learning in Motivating Egyptian Logistic Learners

Aisha Tarek Noour, Nick Hubbard

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***Abstract*—**Learner motivation is considered to be an important component for the Blended e-Learning (BL) Method. BL is an effective learning method in multiple domains, which opens several opportunities for its participants to engage in the learning environment. This research explores the learners' perspective of BL according to the Self-Determination Theory (SDT). It identifies the opportunities and challenges for using the BL in Logistics Education (LE) in Egyptian Higher Education (HE). SDT is approached from different perspectives within the relationship between Intrinsic Motivation (IM), Extrinsic Motivation (EM) and Amotivation (AM). A self-administered face-to-face questionnaire was used to collect data from learners who were geographically widely spread around three colleges of International Transport and Logistics (CILTs) at the Arab Academy for Science, Technology and Maritime Transport (AAST&MT) in Egypt. Six hundred and sixteen undergraduates responded to a questionnaire survey. Respondents were drawn from three branches in Greater Cairo, Alexandria, and Port Said. The data analysis used was SPSS [22] and AMOS [18].

***Keywords*—**Intrinsic Motivation, Extrinsic Motivation, Amotivation, Blended e-Learning, Self Determination Theory.

I. Introduction

THE growth of media tools in education has been controversial, especially in motivating learners [1]. Research evidence suggests that motivation should be taken seriously in the virtual learning environment (VLE) [2; p. 742] but has not received sufficient attention [3], [4]. BL is one method of the VLE, which is a relatively recent phenomenon in education and corporation training. BL is an interactive learning method, as it combines the TF2F learning and e-Learning methods together to achieve better learning outcomes. Research exists on the concept of BL which has proved its effectiveness in motivating learners [5], [6]. However, up to now, there is widespread debate about the opportunities and challenges of BL in motivating learners in higher education. Therefore, researchers must pay full attention to identifying the right opportunities and challenges of BL. Finally, there has so far been no attention given to the issue of BL for logistics educators, especially on learners' perspectives.

Ms. Aisha Noour is with the Department of Marketing and International Business, Undergraduate School of Business Administration, Arab Academy for Science, Technology and Maritime Transport (AAST&MT), Egypt, and Part-time researcher in Division of Logistics, Transport and Tourism, The Business School, University of Huddersfield, UK (e-mail: Nano_noour@yahoo.com; U0976087@hud.ac.uk).

Dr. Nick Hubbard is with the Division of Logistics, Transport and Tourism, The Business School, University of Huddersfield, UK (e-mail: n.j.hubbard@hud.ac.uk).

II. Self Determination Theory

Self Determination Theory (SDT) is a framework for motivation developed by Edward L. Deci and Richard M. Ryan (1985). *SDT is ''one of the most comprehensive and empirically supported theories of motivation available today"* [7; p. 257]. SDT is used interchangeably with the term Intrinsic Motivation (IM). Motivation theories are recognized as unidimensional concepts [8]-[10] but the concept of SDT is known also as a multidimensional theory [11]. Researchers have documented the role of educational consequences in IM and EM [12]. In many cases, undergraduate learners are not using purely self-determined learning, as it is not considered to be effective with respect to examination performance [6]. On the other hand, motivation is a fundamental factor for motivating learners for ensuring their success, which will enable them to be self-determined in engaging and competing in tasks effectively [13]. SDT suggests that the learner's level of self-determination is recognized by the satisfaction of three types of motivation: Intrinsic Motivation (IM), Extrinsic Motivation (EM) and Amotivation (AM). Researchers propose that the three types of motivation are essential to motivation and growth in various domains [14], for example: education, medicine, psychology, counseling, healthcare, and sports. Therefore, motivation is necessary to learning no matter what the setting [15].

A. Intrinsic Motivation

Intrinsic motivation (IM) exists in the relationship between individuals and activities [8; p. 56]. The most often quoted definition is that of Ryan & Deci, who define IM as when an individual is doing an activity for its inherent satisfaction rather than for some separable outcome [9]. IM is considered to be the highest level of self-determination, which involves pursuing an activity for its own sake because it is interesting and enjoyable [13]. IM refers to intangible rewards, which is when learners perform a task for the sake of happiness. From the learners' perspectives, IM consists of different opportunities of BL, including time management, flexibility in access, feedback and assessment, social interaction, ease of use, geographical audience, general awareness, learning experience and learning style. This means that the feedback factor in the VLE can be described as information provided to learners to increase performance [16]. Learners accept the use

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of internet technology in education for the benefits of ease of access to information, and flexibility in arranging courses [17]. Learners could also have new learning experiences in merged resources which provide flexibility and more choices for access to information [18]. VLE offers more benefits for learners, including flexibility and ease of communication for some learners who work full-time and need to travel to the university [19]. A previous study has asserted that the BL method is recognized as the educational method of access to daily knowledge and information content, social interaction, personal agency, cost effectiveness and ease of revision [20].

B. Extrinsic Motivation

Extrinsic motivation (EM) classifies when the individual interest of an activity to achieve an outcome is separated from the activity itself [13]. This means that the individual performs the activities for tangible rewards or to avoid certain punishments. One of the reasons for learners engaging in virtual classroom activities is for better grades. EM rewards do not decrease IM, as it is measured by time spent on an activity following the removal of a reward [21]. However, EM is not well defined in the literature [12] and there are few studies concerning EM in schools as a function of age. EM is divided into external, introjected, identified and integrated regulations [14]. First, external regulation refers to individuals who are pleased with an activity for reasons external to the process of participation [22]. Second, introjected regulation means individuals who are supported or threatened with guilt or shame. A third type of EM is identified regulation, which refers to "where the individual's behavior reflects conscious values and is internalized as personally important" [23; p. 353]. Fourth, integrated regulation classifies the value of a task to the individual in its sense of ending not its pleasure [24]. These regulations are identified from the least to the most regarding self-determination.

C. Amotivation

Amotivation (AM) refers to an individual who has a negative outcome in performing activities, and it means anxiety, distraction, dropping out, and negative effects [25]. AM is when an individual experiences a lack of intention to participate in activities. An individual who suffers from lack of either IM or EM to participate in an activity has AM [13]. In the BL environment, learners are suffering from common barriers including technical and facilities support, technological skills, isolation and lack of social interaction, technological infrastructure, resistance to change, and lack of social awareness.

Finally, SDT differentiates between IM and EM [14]. In the field of education, both IM and EM are essential in learners' engagement in the learning experience [26]. The student with high levels of both motives, in contrast, fits with a view of intrinsic and extrinsic motivations, as independent constructs that have the potential to operate simultaneously [27; p. 480]. Intrinsic and extrinsic motivations could be a reason for a person to complete an assignment [28]. Therefore, it is vital to concentrate on motivating learners who are using the BL method to ensure better learning outcomes. Learners need to differentiate between tangible and intangible rewards to be able to perform fruitful outcome learning performances. Sometimes, learners need to have both IM and EM, which increases their level of engagement in the learning process. For example, learners could perform a task because it is interesting and at the same time they need extra tangible rewards, such as extra marks.

III. Blended Learning

BL method has become an increasingly widespread delivery approach for today's education. The BL method is an interesting research topic in the literature; nevertheless, there is not yet a single recognized definition of this method [29] that the majority of researchers have agreed on. The term BL method is a mixture of the use of Virtual Learning (VL) tools, including Distributed Learning, Open and Flexible Learning, "Mixed Mode Method Learning" [30], [31], "Blended Learning, Hybrid Learning, Web-Enhanced Classes, Technology-Enhanced Education" [32], and Integrated e-Learning [33]. The BL method benefits learners as it incorporates TF2F method with VL methods and this could provide the participants with the benefits of a sudden switch to the pure e-Learning method [34]. This study suggests that from the learners' perspectives, the advantages of the BL method could be categorized into extrinsic and intrinsic motivations.

IV. Research Methodology

A. Data Collection

This research study conducted self-administered face-to-face questionnaires. The respondents completed the research measures in the classroom setting. Respondents were from three branches in the CILTs, AAST&MT located in Egypt: Greater Cairo, Alexandria and Port Said. The data collection was conducted in the Fall Semester 2012. This case study examines Egyptian undergraduates' IM, EM and AM in relation to the BL concept.

B. Participants

Participants were 616 undergraduate logistics learners who agreed to complete the questionnaire. This study used pilot testing, whose sample was 70 learners. Respondents were from the English Undergraduate Programme of the three branches in CILTs, AAST&MT located in Egypt. The demographic questionnaire asked respondents to report their location, age and gender. Among the respondents who participated in this survey, 81.2% (N =500) of them were from Greater Cairo, 14.9% (N =92) were from Alexandria and 3.9% (N =24) were from Port Said. 72.2% (N=445) were male and 27.8% (N =171) were female. In the terms of age range, approximately 25.2% (N =155) of the respondents were under 18 years, 67.7% (N =417) were 18-22 years of age, 6.5% (N = 40) were 23-25 years of age, and 0.6% (N =4) were above 26 years of age.

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C. Instruments

For each activity, logistics learners were asked about their opinions of the BL method. IM, EM, AM were measured using 106 items. The measure of academic IM was composed of 66 items that tapped whether students accepted engaging in academic activities for intrinsic reasons, that is, IM was divided into eleven sub-variables, including Time Management (e.g., "I think that Blended e-Learning will help me to manage my time effectively and successfully), Cost Effectiveness (e.g., "I think that Blended e-Learning will help me in cutting my study expenses, such as cost for paper printing"), Flexibility in Access (e.g., "I think that Blended e-Learning will help me to access to my course resources 24/7"), Social Interaction (e.g. "I think that Blended e-Learning allows for off campus interaction between students and instructors"), Feedback and Assessment (e.g. "I think that Blended e-Learning will provide valuable and quick feedback from instructors"), Learning Style (e.g. "I think that Blended e-Learning will change my style of learning in a better way"), Attendance Issues (e.g. "I think that Blended e-Learning solved the issue of attending classes regularly"), Ease of Use (e.g. "I think that Blended e-Learning helps me to follow courses more easily and faster"), Social Awareness (e.g. "I think that Blended e-Learning increases my awareness about the learning process"), Geographical Audience (e.g. "I think that Blended e-Learning can reach a wider audience of students in different places"), and Learning Experience (e.g. "I think that Blended e-Learning will provide me with great online experiences"). However, the EM was divided into 4 sub-variables, which are Integrated Regulation (e.g. "I think that Blended e-Learning will help me to develop different approaches to learning"), Identified Regulation which are (e.g. "I believe that Blended e-Learning will eventually allow me to feel better in my educational learning"), Introjected Regulation (e.g. "I believe that Blended e-Learning will make me feel guilty if I am not doing anything about my learning"), and External Regulation (e.g. "I believe that I will receive extra marks in the Blended e-Learning class compared to the traditional face-to-face learning method"). Amotivation was divided into six sub-variables which are Technological Infrastructure (e.g. "I think that our country's infrastructure is not strong enough to adopt Blended e-Learning"), Lack of Social Awareness (e.g. "I believe that I don't have sufficient information about any new learning methods"), Lack of Technical and Facilities Support (e.g. "I believe that Blended e-Leaning will be difficult because the university computers and software programmes are too old and need technical maintenance and support"), Isolation and Lack of Social Interaction (e.g. "I think that Blended e-Learning creates a problem in contacting instructors and students for traditional face-to-face meetings"), Resistance to Change (e.g. "I am not looking forward to using online learning"), and Technological Skills (e.g. "I have no experience on opening and downloading online course resources").The respondents answered each of the three variables on a 5-point Likert scale ranging from "Strongly disagree" (1) to "Strongly agree" (5).The data analysis conducted a Confirmatory Factor Analysis (CFA).

D. Hypotheses Testing

Hypotheses of the study are classified as follows:

H1. Intangible opportunities of Blended e-Learning are factors of Intrinsic Motivation.

H2. Tangible opportunities of Blended e-Learning are factors of Extrinsic Motivation.

H3. Challenges of Blended e-Learning are factors of Amotivation.

V. Results and Discussion

This section presents an empirical study for the current research through displaying statistical analysis and the findings of the studied sample of learners in the CITLs at AAST&MT. The analysis aims to provide a study of the IM, EM, and AM for learners in the sample under study and define the factors that represent each of the above-mentioned dimensions. The researcher will test if IM could be represented with the variables; Time Management, Cost Effectiveness, Flexibility in Access, Social Interaction, Feedback and Assessment, Learning Style, Attendance Issues, Ease of Use, General Awareness, Geographical Audience, and Learning Experience. In addition, the researcher assumes that EM is represented by the following dimensions; Integrated, Identified, Introjected and External Regulations. In addition, the researcher represents Amotivation by Technological Infrastructure, Lack of Social Awareness, Lack of Technical and Facilities Support, Isolation and Lack of Social Interaction, Resistance to Change, and Lack of Technological Skills. Typically, data analysis is performed by applying CFA using the AMOS[18] statistical package.

A. Testing

In this section, the researcher tests if data is reliable and valid or not. If both conditions are satisfied, the researcher can start using the data available in responding to the hypothesis of the study. All items having an alpha coefficient greater than α 0.7 are considered as reliable items [35]. All loadings of items for each of the variables under study exceed α 0.60.The internal reliability of the IM scale was α 0.968 out of 53 items, the EM scale was α 0.949 out of 19 items, and the AM scale was α 0.919 out of 24 items. It can be noticed that Cronbach's Alpha for all items under study is greater than α 0.7. The study indicates adequate validity for the variables under study, whose IM scale was 0.984, EM scale was 0.976 and AM scale was 0.959. Cronbach's Alphas for all the sub-variables ranged from α 0.967 (Social Interaction/ IM) to α 0.885 (Lack of Technical and Facilities Support/ AM). Finally, the total reliability scale was α 0.978 out of 106 items, and the validity scale was 0.989.

B. Analysis

The researcher employed a CFA to test the factors that could be included in the dimensions IM, EM, and AM. CFA is a type of Structural Equation Modeling (SEM) that deals specifically with measuring models, that is, the relationship between observed measures or indicators and latent variables. The AMOS[18] programme is used to apply CFA based on the

maximum likelihood for the reflective variables. Table I displays the model fit indicators of CFA which are the minimum discrepancy (CMIN)=1.584, ρ-Value < .00, Goodness of Fit Index (GFI)=0.955, Comparative Fit Index (CFI)=0.966, Incremental Fit Index (IFI)=0.979, Tucker-Lewis Index (TLI)=0.975, Root Mean Square of Approximation (RMSEA)=0.031, and Root Mean Square Residual (RMR)=0.037. It was found that the values of the above mentioned indicators are acceptable, which means that the divisions estimated for IM, EM, and AM are fitting.

The variables and relationships are shown in Fig. 2; they show the diagram of CFA. AMOS is used to display the variables. The findings of this study indicate that the Cost Effectiveness and Attendance Issues from the sub-variables of "IM" are not needed, and have been removed to improve the research model.

TABLE I
SOME FIT MEASURES OF THE OVERALL STRUCTURED MODEL

Measure	Model Results	Threshold
Chi-square/df (cmin/df)	1.584	**< 3 good; < 5 sometimes permissible**
P-value for the model	0.000	**< 0.05**
GFI	0.966	**> 0.95**
AGFI	0.955	**> 0.80**
NFI	0.946	**> 0.90**
TLI	0.975	**> 0.95**
IFI	0.979	**> 0.95**
CFI	0.979	**> 0.95 great; > 0.90 traditional; > 0.80 sometimes permissible**
RMR	0.037	**< 0.09**
RMSEA	0.031	**< 0.05 good; 0.05-0.10 moderate; > 0.10 bad**
PCLOSE	0.947	**> 0.05**

Note. GFI = Goodness of Fit Index, AGFI=Adjusted Goodness-of-Fit Index, RMR=Root Mean Residual, RMSEA=Root Mean Square Error of Approximation, RMSEA=Root Mean Square Error of Approximation, IFI=Incremental Index of Fit, TLI=Tucker–Lewis Index, CFI=Comparative Fit Index.

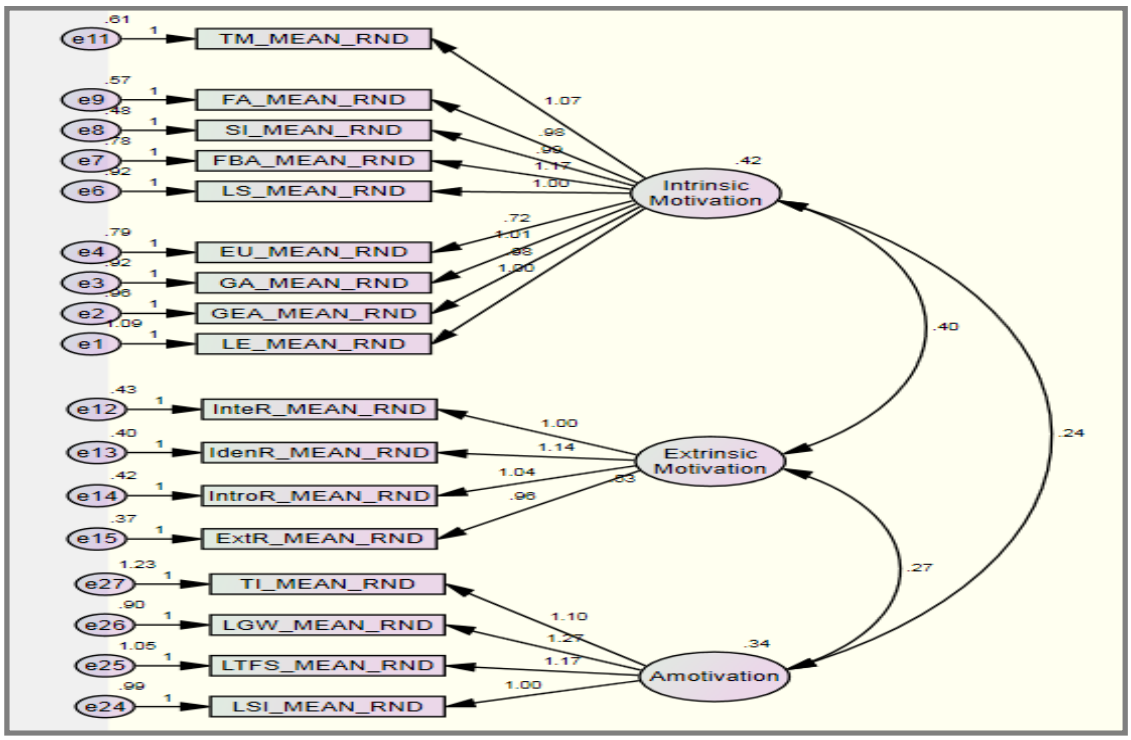


Fig. 1 CFA for Variables with Relations

Note. TM_MEAN_RND = Time Management; FA-MEAN_RND= Flexibility in Accessing; SI_ MEAN_RND= Social Interaction; FBA_ MEAN_RND= Feedback and Assessment issues; LS_ MEAN_RND= Learning Style; EU_ MEAN_RND= Ease of Use Issue; GW_ MEAN_RND= Social Awareness; GEA_ MEAN_RND= Geographical Audience; LE_ MEAN_RND= Learning Experience; InteR_ MEAN_RND= Integrated Regulation; IdenR_ MEAN_RND=Identified Regulation; IntroR_ MEAN_RND= Introjected Regulation; ExtR_ MEAN_RND= External Regulation; TI_ MEAN_RND= Technological Infrastructure , LGW_ MEAN_RND= Lack of General Awareness; LTFS_ MEAN_RND= Lack of Technical and Facilities Support; LSI_ MEAN_RND= Lack of Social Interaction.

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TABLE II
ESTIMATES OF CFA FOR THE VARIABLES UNDER STUDY

Sub-Variables	Variables	Est.	S.E.	C.R.	P
Learning Experience [LE)	Intrinsic Motivation	1.000			
Geographical Audience [GEA]	Intrinsic Motivation	.966	.097	9.968	***
General Awareness [GA]	Intrinsic Motivation	1.018	.098	10.357	***
Ease of Use [EU]	Intrinsic Motivation	.714	.080	8.971	***
Learning Style [LS]	Intrinsic Motivation	1.002	.098	10.257	***
Feedback and Assessment [FBA]	Intrinsic Motivation	1.141	.103	11.071	***
Social Interaction [SI]	Intrinsic Motivation	1.005	.87	11.568	***
Flexibility in Access [FA]	Intrinsic Motivation	.969	.087	11.096	***
Time Management [TM]	Intrinsic Motivation	1.062	.094	11.299	***
Integration Regulation [InteR]	Extrinsic Motivation	1.000			
Identified Regulation [IdenR]	Extrinsic Motivation	1.177	.066	17.708	***
Introjected Regulation [IntroR]	Extrinsic Motivation	1.096	063	17.370	***
External regulation [ExtR]	Extrinsic Motivation	.959	.058	16.559	***
Isolation and Lack of Social Interaction [LSI]	Amotivation	1.000			
Lack of Technical and Facilities Support [LTF]	Amotivation	1.165	.147	7.916	***
Lack of Social Awareness [LGW}	Amotivation	1.210	.152	7.973	***
Technological Infrastructure [TI]	Amotivation	.975	.135	7.195	***

EST. = Estimate

Resistance to Change and Lack of Technological Skills are deleted from the dimension "AM" due to their high negative covariance, which let them be statistically rejected. On the other hand, the researcher did not delete any of the sub-dimensions proposed for EM. Table II shows the estimates of the CFA and their significance level. It could be observed that estimates after deleting the above-mentioned variables are all significant at 0.05 significance level.

Observing the outcomes of the analysis done in the current study, it was noticeable that there are some items that the researcher could highlight and consider as contents of each of the variables IM, EM, and AM. The variables chosen were tested if they can belong to each of the assigned dimensions or not. Testing was based on the idea that some items together will increase learners pleasure while applying the BL method, including time management, feedback and assessment, and general awareness. Those items are considered as items of IM. In case of EM, the researcher's opinion was supported and revised by previous studies, which claim that the four types of EM have different effects on the BL method [6], [36]. Furthermore, other researchers pointed out that loneliness and isolation, lack of motivation, poor communication, fear of online communication and lack of guidance are considered as barriers for BL which cause challenges facing learners in accepting the BL method and in turn increasing learners AM towards BL [37]. The variables observed in the contents of IM, EM, and AM from learners perspective according to Egyptian culture in accepting BL environment are the ones which was found as output of this current research.

VI. CONCLUSION AND RECOMMENDATION

Motivation plays an important role in a virtual educational system. This study examined the influence of learner motivation on the opportunities and challenges of the BL method. The study found a positive and mutually causal relationship between learners' motivation and IM, EM and AM. This study develops the opportunities as well as the challenges of BL, whose opportunities were classified into intrinsic and extrinsic motivations. All variables referred to as IM are intangible rewards in adapting BL, in contrast with EM, which include tangible rewards for BL. On the other hand, challenges facing learners are referred to as AM.

VII. FUTURE RESEARCH

For further research, there are some topics that could be highlighted. One of them is to construct a comparison between developed and developing countries to be able to know different biases towards IM, EM, and AM. Also, further research could highlight barriers of AM, as well as challenges facing instructors through those barriers and how to overcome such challenges.

VIII. LIMITATION OF THE STUDY

One most important limitation was that there is no Logistics educator in Egypt except at the AAST&MT restricting the sample to one institution. It also should be mentioned that the AAST&MT is a private university, which lets it enjoy relatively better BL media tools. Such tools might not be present in other universities in Egypt. Finally, the researcher was limited in the study in getting data from Egypt only; this was due to geographical constraints.

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