READINESS FOR E-LEARNING

Zlatko NEDELKO, Vojko POTOCAN
Faculty of Economics and Business, University of Maribo, Razlagova 14, 2000 Maribor, Slovenia
zlatko.nedelko@uni-mb.si, vojko.potocan@uni-mb.si

Carmen Elena CIRNU
Faculty of Philosophy, University of Bucharest, Splaiul Independentei 204, 060024, Bucharest, Romania
carmen.cirnu@gmail.com

Abstract: E-learning has become an important way of transferring knowledge in modern society. Despite the growing interest for e-learning, both from educational institutions and potential participants, there are still some important impediments in e-learning process. Often addressed issue by theoreticians and practitioners is participant’s readiness for e-learning, since e-learning represents radically new way of learning in comparison to traditional education. In the frame of participant’s readiness for e-learning the paper addresses the impact of participant’s personal values on participant’s preferences about information-communication technology. Hypothesized model about the impact of selected personal values of students on their preferences about information-communication technology is in-depth examined in paper. Casual relations are tested on samples of Romanian and Slovenian undergraduate students, involved at least in web-supported type of e-learning. Structural equation modeling approach was used.

Keywords: E-learning, Information-communication technology, Personal values, Slovenia, Romania.

I. INTRODUCTION

In literature a plethora of definitions are involved when talking about distance education. According to several proposed [23, 25, 29, 31] one’s most general and/or common definition of distance education defines it as any education in which participants (i.e. learners and educator) are at a distance and physically separated from each other (e.g. are not at same place at same time).

Distance education has been in existence for more than a century in various types [17, 22, 31]. Therefore at the beginning distance education was enabled through printing press and traditional post, followed by audio and video tapes, voice records, audio and videoconference, campus portal access to learning resources, etc. [17, 23]. Especially in last two decades advancement in information and communication technology (ICT) has importantly influenced nature of distance education. Therefore the distance education nowadays is almost exclusively ICT supported [9, 15, 21]. This type of distance education is in literature known under common term e-learning [19, 25]. E-learning has nowadays become an important way of learning in modern society.

E-learning has increasingly become an area of interest in the academic literature since early 1990s [2, 21, 22, 32]. Based on the researching academic literature about e-learning it is evident that there has been shift in focus from “hard issues” (e.g. technology for supporting e-learning) towards “soft issues” related to participants preferences about e-learning (e.g. readiness to participate in e-learning class, changed role of instructors and learners, changed relationship instructor-learner, etc.) See for example [2, 4, 11, 19, 21, 25, 28, 30, 31].

Among various possible open issues suggested by review existing discussions about “hard and soft issues” it is evident that there is no evidence about existing holistic approach to examining the impact of personal values of participants in e-learning process on their preferences about ICT.
Therefore preferences about ICT represent an important viewpoint of participant’s readiness for entering/learning in e-learning process. This is important mainly due to the two following reasons:

1. e-learning represent a shift from traditional education towards distance education, where usage of ICT is needed in order to successfully participate in e-learning process;
2. that the behavior of each person is importantly guided by this person’s personal values [18, 26, 27].

In that framework, we therefore put our focus on (selected) participant’s personal values, which represent a basis for assessing participant’s preferences about ICT.

Therefore the main purpose of this paper is to test hypothesized model about the impact of selected personal values of students on their preferences about ICT. Casual relations are tested on sample of Romanian and Slovenian undergraduate students, involved in at least web-supported type of e-learning.

II. LITERATURE REVIEW

2.1 E-learning

We can discuss various definitions about e-learning. According to several proposed definitions, e-learning refers to any education in which participants are not collocated (i.e. not at same place at same time) [23, 25, 29, 31]. On the other hand [16] defines e-learning, as:

1. Learning which is facilitated and supported with use of modern ICT and computers;
2. Training and/or learning that takes palace via the web;
3. Learning that is facilitated by the use of digital tools and content;
4. Education offered using electronic delivery methods (e.g. CD-ROMs).

E-learning involves also quasi permanent physical separation of participants in e-learning process (e.g. teacher and learners), the use of modern ICT and media for supporting e-learning process and the provision of two way communication (e.g. videoconferencing), and is also using the influence of an educational organization in providing participant support (e.g. library services) and the quasi permanent absence of learning groups [12].

Different authors [2, 3, 23] are proposing different typologies and/or classifications of e-learning, but according to the purpose of our discussion we are taking into consideration a frequently used typology (and/or classification) of e-learning, which distinguish between following types of e-learning [11, 12, 19, 21]:

1. Web supported e-learning – is the e-learning format which is usually complementary to traditional learning, where all participants are collocated (i.e. are at same place at same time). A “web site” (i.e. portal for e-learning) is provided which, contains course materials, assignments, goals, exercises and short tests;
2. The blended (i.e. mixed-mode) e-learning type is the e-learning type where course is structured so that part of the class sessions are held in a traditional setting (i.e. classroom) and part of them are held with usage of modern ICT over internet (i.e. e-learning). Thus mixture of face-to-face mode and distance mode has become commonly used in nowadays education practice;
3. The fully online e-learning type is the one where every class session is held in distance mode in comparison to previously mentioned formats, when face-to-face mode is complementary to distance mode.

Talking about e-learning means also talking about benefits and disadvantages of this process [7, 8, 10]. Time flexibility since participants (i.e. students) can set their own pace of study; they are not bind to fixed schedule and can therefore study at any time. Place flexibility since participants can live anywhere and study from anywhere, e-learning is available at any location and thus is accessible to a very broad range of (possible) participants, the fact that e-learning does not require commuting (e.g. fewer expenses) and that is easy updating of content as well as archival capabilities (e.g. e-literature) are several possible key benefits of e-learning [1, 3, 10, 19, 24].

On the other hand lack of face-to-face contact (i.e. lack of social interaction and inability to perceive non-verbal communication), costly and complex technology (each participant must own a
computer and adequate internet connection), the limited additional support for participant in e-learning process (e.g. library resources, counseling), the fact that participant’s success depends on technology and theirs’ abilities (e.g. skills for working with computer and modern ICT), not to mention that participant’s success in e-learning process is importantly dependent upon s(he)’s personal characteristics and readiness for such a way of education are most common possible disadvantages of e-learning process [10, 28, 32].

Based on above presented characteristics of e-learning and education practice, we can most tentatively conclude that use of ICT itself is not a guarantee for participants’ success in e-learning process [24]. Therefore also the viewpoint of participant’s readiness must be taken into account. According to the proposed aims of this paper we put our focus on examination of the impact of selected student’s personal values on their preferences about ICT.

2.2 Values of e-learning and preferences about ICT

Many different definitions of term value, which also different considerably, exists in literature [18, 26, 27]. A simple definition takes value as something what is regarded as desirable, worthy, right or as a belief [14, 20]. An important and often used definition, provided by [27], defines values as beliefs that a specific mode of conduct or end-state is socially preferable to an opposite mode of conduct or end-state.

There is no definite consensus about the impact of personal values on people's behavior. But according to the several well known and recognized researches about personal values, we can argue, that people’s behavior is mainly guided by their personal values [5, 18, 26, 27]. In that context personal value system importantly influences preferable modes of conduct and/or end-states [13, 27].

Therefore we can suppose that participants’ personal values have a great impact on the participant’s preferences about ICT. Therefore is important that participants posses and/or have (e.g. personal/specific) values which are basis for ensuring successful participation in e-learning process, regarding their preferences about ICT. Based on above presented cognitions from prior researches about the importance of personal values for people’s behavior, we can in the frame of selected viewpoint in this paper, summarize that personal values of participant’s in e-learning importantly influence participant’s preferences about ICT.

For the purpose of this examination we are taking into consideration only selected personal values (from person’s value system) which may importantly influence participant’s preferences about ICT. Those values are:

- Sense of belonging – since there is no regular meetings (not even occasionally) the sense of belongingness to group should be at lower level of importance.
- Loneliness – participants should feel very comfortable to working alone (i.e. working at distance), since e-learning requires working outside traditional educational areas.
- Enjoying life – participants want to enjoy their lives, therefore it is important for them to have flexible schedule, which is enabled by e-learning.
- Dynamic live – participants must be willing to accept non-routine live, since e-learning represents a new way of education.
- Self-discipline – due to the nature of e-learning (e.g. no direct personal supervisor) participants must be very self-disciplined in order to succeed.
- Responsibility and reliability – participants in e-learning set their own pace of education, therefore must be very responsible and reliable.
- An exciting life – participants in e-learning find themselves in different, often unpredicted situations, where there may be no one to help them (e.g. an advice from supervisor).
- Curiosity – participants in e-learning must be interesting in exploring new things, be interested in different possible outcomes, etc.

We hypothesized that participants must be prepared and willing to use modern ICT, since e-learning is based on ICT. Therefore participants should also have favorable preferences about ICT. For the purpose of our working we considered preferences about ICT, to be most general represented by [10, 19, 28, 32]: (1) participant’s own assessment of his/her skills for using ICT and working with ICT, (2) how important is for participants to use modern ICT in their lives, and (3) participant’s attitudes towards modern ICT (in most general sense).
III. RESEARCH MODEL AND METHODOLOGY

Proposed model evaluates how personal values of participants in e-learning process (represented by the latent construct of PERSONAL VALUES) predicts (and/or influence) the participant’s preferences about ICT (represented by the latent construct ICT). As it is not assumed that the preferences about ICT will be perfectly predicted by selected personal values of participants, this dependent variable (i.e., preferences about ICT) includes a residual (er12).

Formulation of the hypothesized model presented in Figure 1 derived from the consensus of findings from a review of relevant literature about the impact of personal values on our preferences towards using ICT (see sections above). Therefore postulated hypothesis is that “Personal values of e-learning participants importantly positively influence their preferences about ICT.” Model is depicted in Figure 1.

In model we have two latent (i.e., unobservable) variables, namely personal values and preferences about ICT. Since those two variables cannot be observed directly we identified several manifest variables, which serve as indicators of the underlying construct which they are presumed to represent. Based on findings in relevant literature, educational practice, and own prior research (see sections above) we can most generally conclude that the selected personal values (represented construct personal values) have greatest impact preferences about ICT. On the other hand we can most generally presume the multidimensionality of the construct preferences about ICT. For this purpose we adopt three factor structure (see literature above).

In the frame of assessment of hypothesized model (with structural equation modeling) we first present results about goodness-of-fit of the model and modification indices for all 306 respondents in research. This is followed by the test whether or not structural model is equivalent in Romania and Slovenia. Therefore further analyses bearing on test for equivalence across total samples of Romanian respondents (151) and Slovenian respondents (155). In the interest of space only the final model, as determined from post-hoc model-fitting procedures, will be displayed.

The input covariance matrix generated from the model’s 11 observed variables contains 66 sample moments. For the hypothesized model there are 23 parameters to be estimated, i.e. 13 variances and 10 regression weights. The model (see Figure 1), therefore, has positive degrees of freedom, which makes the model identified. The chi-square goodness-of-fit statistics was computed. The results indicate that the model did not fit the data well by the chi-square test, χ² (N = 306, df = 43) = 180.234, p < 0.05.
In research practice $\chi^2$ provides little guidance in determining the extent to which the model does not fit the data. Therefore we base our decision also on selected indices of fit. Amos output provides us with numerous indices of fit. We used baseline comparison CFI and RMSEA.

In reviewing these fit indices, we can see that the hypothesized model is relatively poor fitting as indicated by a CFI of 0.733 and RMSEA value of 0.102, which is not within the recommended range of acceptability ($< 0.05$ to 0.08). Also the closeness of fit (PCLOSE), which test the hypothesis that the RMSEA is good in the population, is 0.000, which is significant below desired $> 0.50$. This is probably due to the RMSEA tendency to over reject true population models in small samples, like it is ours. Also other baseline comparisons fit indices NFI, RFI, andIFI, besides CFI, indicate poor fitting model.

A review of modification indices (MIs) reveals evidence of misfit the model. We adopt step by step approach in respecification of hypothesized model regarding MIs. In review the list of MIs we turn our attention to the MIs related to covariances. We see very clear evidence of misspecification associated with the pairing of error terms associated with sense of belonging and loneliness (er1<->er8; MI = 30.752).

In respecified Model 2 we add the error covariance er1<->er8 (see Figure 2). Goodness-of-fit statistics related to Model 2 revealed that incorporation of error covariance made a substantially improvement to model fit, $\chi^2 (N = 306, df = 42) = 147.435, p < 0.05$. CFI is 0.795 and RMSEA value is 0.091. Reviewing MIs for Model 2 reveals evidence of misspecification associated with the pairing of error terms associated with enjoying life and exciting life (er3<->er4; MI = 33.644). In respecified Model 3 we add the error covariance er3<->er4, which made a substantial improvement to model fit, $\chi^2 (N = 306, df = 41) = 104.272, p < 0.05$. CFI is 0.877 and RMSEA value is 0.071. Again reviewing MIs for Model 3 reveals evidence of misspecification associated with the pairing of error terms associated with self-dicpline and responsibility and reliability. In respecified Model 4 we add the error covariance er5<->er7, which made improvement to model fit, $\chi^2 (N = 306, df = 41) = 90.256, p < 0.05$. CFI is 0.902 and RMSEA value is 0.064. Regarding to the MIs no further consideration was given to inclusion of additional parameters. There is evidence, that hypothesized values belongingness and loneliness are irrelevant to the model as evident from their statistical nonsignificance. We deleted them from the model. In respecified Model 5, deleting two variables, made improvement to model fit $\chi^2 (N = 306, df = 24) = 44.712, p < 0.05$. CFI is 0.953. Baseline comparisons fit indices NFI, IFI, and TLI, besides CFI, indicate well fitting model (all are above 0.9; range 0.90 to 0.954). Turning to the RMSEA, we see that RMSEA value for Model 5 is 0.053, with the 90% confidence interval ranging from 0.028 to 0.077 and the p-value for the test of closeness of fit (PCLOSE) equal to 0.384. Based on this values we can conclude that we can be 90% confident that the true RMSEA value in the population will fall within the bounds of 0.028 and 0.077, which represent a good degree of precisions, especially in small samples, like it is ours. We can conclude that respecified Model 5 fits the data well. Final model is shown in Figure 2.

![Figure 2](image.png)

**Figure 2.** Final model of causal structure for the impact of personal values on the preferences about ICT.

Now we are turning our attention to examine selected results.
IV. DISCUSSION AND CONCLUSIONS

Turning first to the standardized regression weights, all are statistically significant by the critical ratio test. The results indicate that personal values (i.e. perceptions about selected values, represented by construct) significantly and positively impact on preferences about ICT (standardized regression weight: $\beta = 0.587$, $p < 0.001$).

Regression weights also revealed that the 9 observed measurement variables (six personal values and three indicators for preferences about ICT) are all significantly represented by their respective latent constructs ($p < 0.001$).

Regarding the error covariance between self-discipline – responsibility and reliability and enjoying life and exciting life we can summarize that both pairs tend to expressing the same idea, albeit their focus is significant different. We can therefore suppose the correlated errors are due to the item content overlap.

The squared multiple correlations show that 34.5% of the variance of preferences about ICT is accounted for by the variance in selected personal values. Remaining variance in preferences about ICT cannot be explained by the model, and it is thus attributed to the unique factor er12.

This is due to the fact that synergetic set of hard and soft (also rational and irrational) factors influence preferences about ICT. Those are factors that affect preferences about ICT, but do not appear in proposed model. In that circumstances we can assume that selected personal values have a great explanatory power, since they explain 34.5% of variance in preferences about ICT.

In the frame of explaining factor loadings, we will examine total, direct, and indirect effects, encountered in hypothesized Model 5.

Results indicate that preferences about ICT depends directly on personal values only. The total effect of personal values on preferences about ICT is 0.587. The fact that effect is positive means that, all other thing being equal, relatively high values of selected personal values are associated with relatively favorable preferences about ICT. More accurately this means that with rising importance of single value impacting preferences about ICT, the preferences about ICT are more favorable.

Regarding the impact of selected personal values and preferences about ICT on indicators measuring preferences about ICT, we can conclude following:

- Strong direct effects on preferences about ICT have especially importance of ICT, followed by attitudes towards ICT, while the lowest effect have ICT skills.
- Regarding the indirect effect of personal values on indicators of preferences about ICT, is moderate indirect effect of personal values on importance of ICT, while weak is on attitudes towards ICT and ICT skills.

Single personal values, selected as indicators of personal values, depend directly on personal values only; effects range from 0.263 to 0.692. There is no indirect effect of preferences about ICT on single personal values. There is also no indirect impact of single personal values on preferences about ICT; rather there is quite reasonable evidence of indirect impact of personal values (as a construct) on preferences about ICT. This is probably due to the synergetic effect nature of personal values in the frame of personal value systems.

Next we examine whether the pattern of structural relationship hypothesized in the path model (i.e. Model 5) follows same dynamics for Romanian and Slovenian sample. In the interest of space we outline only most important results.

Although the chi-square values for both models are statistically significant the CFI value is close to 0.9, i.e. 0.890. Also the RMSEA values for the group-invariant and group-variant path models are 0.058 and 0.059, respectively. These values suggest that the fit of these two models is adequate.

Pairwise comparisons (Slovenia vs. Romania) for regression weights are not significant. Pairwise comparison between path coefficients for Slovenia and Romania is not significant. Therefore the hypothesized model operated similarly for Slovenian and Romanian sample. Thus, the more important are selected personal values for participants, the more favorable are preferences about ICT (Slovenia: $\beta = 0.56$; Romania: $\beta = 0.59$). For Slovenia 32% of the variance of preferences about ICT is accounted for by personal values, for Romania, 35% respectively.

Based on above presented results we can conclude that there exists strong positive impact of selected personal values of students (of participants in learning process) on their preferences about ICT. Highest factor loading on preferences about ICT have importance of ICT (i.e. how important is
ICT for single participant), while on the other hand personal values have moderate indirect effect on importance of ICT, while weaker is on attitudes towards ICT and ICT skills.

Therefore we can conclude that as selected personal values are becoming more important to participants, more favorable are preferences about ICT. Testing hypothesized model at Slovenian and Romanian sample reveals that the hypothesized model operated similarly for both samples. Since more than 30% of variance in preferences about ICT is explained with selected personal values in both samples, we can most tentatively conclude that personal values has strong positive influence on preferences about ICT, among other factors also influence preferences about ICT. This reveals that personal values have strong explanation power of preferences about ICT.

**References**


