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By Moh. R. Dahman & Semiha Dahman
Istanbul University

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Evaluation of a Predictive Model for the Decision of Lifelong Learners to Continue or Drop Out a German Course

Moh. R. Dahman [α] & Semiha Dahman [σ]

Abstract- **The necessary motivation, attitude, and anxiety along with other independent variables, like the placement test scores, influence learners' adequate progress and successful performance in language classrooms. A machine learning model was designed by Dahman and Dag (2019) to predict adult learners' decision to continue or drop out ESOL courses based on the input variables (motivation, attitude, anxiety, and placement test scores). This study investigated the accuracy of this model in a different setup, the decision of lifelong learners to continue or drop out a German Language course. 100 German learners "A2" level have participated in the study, the result showed that the model predicted 95.4%. accuracy for the continuation, and 83.3% accuracy for the dropouts, with an overall accuracy of 94%. The implication of the result and future recommendations are discussed.**

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List of abbreviations

L2:	Second Language
FLS:	Fatih Language School
ESOL:	English to Speakers of Other Languages

Main text

I. Introduction

The modern education system in its standard categories (formal or non-formal) bears loads of structured variables, from which you can adequately assess the desired output of it. For a possible example, in a non formal educational platform, like the second language programs for lifelong learners, *dropout phenomenon* can uniquely represent a critical feature (i.e. output) that's worth for comprehensive investigation. Initially, other features like language achievement, by lifelong learners, can be typically the key hub of necessary attention by the language teacher and effective administration. Commonly this specific feature, language achievement, is scientifically measured by various variables like necessary motivation, attitude towards the learned language, language anxiety, language aptitude, and many other attributes. However, It's crucial to notice *that before the possible beginning of the language course* (i.e. The planned progress to efficiently help learners to achieve desirable language achievement), identifying learners who are potentially at the edge to drop out,but not to continue, represents undoubtedly a significant fact that language teachers and administrators could properly use to reduce the dropout rate.

There has been at ease an immense amount of published study on dropout phenomenon., for example onschool-age student (see, Alexander, Entwisle & Kabbani, 2001; Battin-Pearson, Newcomb, Abbott, Hill, Catalano & Hawkins, 2000),or adults drop out from further and higher education (see, for example, Duque, 2014; Vossensteyn, Kottmann, Jongbloed, Kaiser, Cremonini, Stensaker & Wollscheid, 2015). Nonetheless, noticeably rarely required published research has been conducted on dropouts by adult learners from typical L2 classrooms. The only study, of which we are aware of that examined the role of variables, which might contribute to the decision of continuing or dropout a language course, and ultimately, introduced a consensus predictive model for the decision, was a study by Dahman and Dağ (2019).

In their published study, two dominant goals were investigated, the first goal was typically to attentively examine the relationship between the affective and the demographic variables and the adult learners' decision to continue or drop out ESOL course. And the second goal was precisely to propose a machine learning model to reliably predict the adult learner's decision to resume ESOL course; (before he/she indeed commences the course). Consequently, their adequate model, which fitted the demographic variable (the placement test score) and the affective variables (motivation, attitude, and anxiety), correctly predicted 83.3% of the adult learners' decision to continue ESOL course.

To this end, the scope of this study is precisely to adopt the proposed model, by Dahman and Dağ (2019), in another L2 classroom, that is a German Language Classroom for lifelong learners. Correspondingly, as the framework of this study suggests, *the aim is to evaluate whether the proposed predictive modelby Dahman and Dağ (2019) will be adequate topredict a lifelong learner's decision to continue or notGerman Language course*. Sequence of statistical analysis approach will be used to evaluate the model's result. Subsequently, If the developed model is

Author α: Bizmodule- Europe Research Centre, DAHMAN'S Phi Service, İstanbul, Turkey. e-mail: aodsmodule@gmail.com
Author σ: Istanbul University, Hasan Ali Yücel-Faculty of Education, İstanbul, Turkey, Address: Beyazıt. e-mail: semihas@ogr.iu.edu.tr

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adequate for different languages, e.g. German, other than English (i.e. ESOL courses), this suggests that *the model can serve as an alarm system for identifying the lifelong learners who are merely at the possibility of dropping out German Language course*. And that could graciously assist the responsible stakeholders (administrators and language teachers, and even policymakers) to modify the intended content of their courses and offer increased support to them.

II. Literature Review

In forthcoming section, we will review the literature of the main variables of the proposed model by (Dahman & Dag, 2019). As their study suggested, they categorized two learner variables*, the affective variable, and the demographic variable*. The published result demonstrated statistical differences, between the continued and the dropped out-groups, in the demographic variable (the placement test score) with a magnitude of large effect size (.378). Additionally, the result showed the affective variables (motivation, attitude, and anxiety) accounts for about 50% of the variation between the two groups.

a) *Affective Variables*- The literature of the affective variables, in the L2 acquisition, is entangled. While the purpose of this study is not to focus on the affective variables per se, we considered the dominant classes of them as *motivation, attitude, and anxiety as the proposed model suggested*.

- *Motivation* is the power of stimulating people to accomplish a target. The first motivational dichotomy can be viewed in Gardner (1985) paper; it suggested that there are two main types of motivation: instrumental and integrative. *The integrative motivation* of which learners aim to integrate into the target language culture, and the *instrumenta l*motivation of which learners aim to learn the target language for a functional purpose such as furthering a career or passing an examination(Ellis, R., 2004). Views about this dichotomy can be found in the work by (Gardner and MacIntyre, 1991; Williams and Burden, 1997).

Another motivational dichotomy found is intrinsic versus extrinsic. The extrinsic motivation that learners already have as personal characteristics, and the intrinsic motivation that learners gain or develop inside the classroom. Research studies on this dichotomy can be found in the work by (Dörnyei, 2008; Dörnyei, 2003; Crookes & Schmidt, 1991).

The findings in both dichotomies indicated that there are differences in the socio cultural environment, in which the language learning takes place; that may affect the decision to continue the language class. Inbar, Donitsa & Shohamy (2001), investigated the teaching of Arabic to Hebrew in Israel, it is no surprise the finding showed low motivation, negative attitude, limited achievement, and high dropout rate, all were accounted, due to the conflict with the Arab world (Inbar et al., 2001:298). In another study, Gardner and Smy the (1975) found that the dropout rate is positively correlated with lower motivation. To conclude, learning motivation was found to be the most important determinant of persistence in the second-language study (Clément & And, 1978; Dahman & Dag, 2019). The socio-educational model of language learning by Gardner (1985) is the most common model in the research studied and it's verified through the AMTB - Attitude / Motivation Test Battery (Cochran, McCallum, & Bell, 2010; Robinson, 2005).

- *Attitude* possesses motivational properties and motivation provides attitudinal implications (Gardner, 2008); that indicates attitude as a primary factor of behavior. Plenty of research studies have reviewed attitude as an important variable to cause a positive or negative reaction to language learning (see, for example, Gardner, 2014; Oroujlou & Vahedi, 2011). Bartley (1969, 1970) found that students who continued their language classes were more positive attitudes toward the class than did the dropouts. Gardner and Smy the (1975) also found that dropouts demonstrated fewer positive attitudes than students who continued. AMTB has measure scales for attitude in tandem with motivation.
- Anxiety is another variable which contributes to the process of foreign language classroom learning. Not surprisingly, many research studies have shown the negative impacts of anxiety on (L2) achievement (Ellis, R., 2004). Bailey et al. (2003) established a strong relationship between student dropouts and foreign language anxiety. This anxiety may evidence itself at all stages of the language learning process. The different views on the effect of anxiety on (L2) learning can be found in the work by (Bailey, 1983; Horwitz, Horwitz, & Cope, 1986; Aida, 1994). Gardner (1987) in his paper "The Role of Anxiety in Second Language Performance of Language Dropouts", suggested that anxiety plays a significant role in language learning. Horwitz (1991) estimated that foreign language anxiety accounts for approximately 25% of the variance in foreign-language performance.

To conclude, "anxiety can play a significant causal role in creating individual differences in both language learning and communication" (MacIntyre, 1995: 90). That indicates the causal link between the anxiety and the adult learners' decision to continue or drop out in language classes. The Foreign Language Learning Anxiety Scale (FLCAS), developed by Horwitz et al. (1986) is one of the common models in research

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studies to measure the degree and source of learners' classroom language anxiety.

i. *Demographic Variables* are individual characteristics assigned to some variables; Oxford (as cited in Onwuegbuzie et al., 2000) mentioned that gender differences exist in language learning strategies. Ehrman and Oxford (1995) found that age is related to the second language acquisition. Another demographic variable was reviewed in Onwuegbuzieet al., (2000) literature review; the study stated that "*one may assume that students who have visited many foreign countries and whose immediate family members speak one or more foreign languages proficiently are more inclined to appreciate the benefits of foreign language acquisition, and, consequently, are more motivated to learn a language than are their counterparts*" (Onwuegbuzieet al., 2000:6). The work is another demographic variable often cited in literatures. Type of work may conflict with classroom hours, might lead to dropout.

In the research study conducted by (Dahman & Dag, 2019), the findings were surprisingly different. The study stated that "*There was evidence of the statistically significant effect of the ESOL adult learners' placement test score (which was identified in this study as a demographic variable) on the decision to continue or drop out a language class; the effect size of the placement test was at large level (.378). Somewhat surprisingly, elements in the demographic variables (like gender, age, marital status, education, job, another spoken language, and is it the first language course) appeared to have no significance or direct effect on the decision to continue or drop out ESOL course among adult learners. Indeed, most of them showed a small effect size. It is possible that there are two reasons to explain this surprising finding. The first reason represents the nature of the services which are offered by FLS. In fact, FLS offers all the services as free of charge, because it's a founded organization by the municipality of Istanbul, Turkey. The second reason is the nature of the classroom in which is a heterogeneous class. Both reasons maybe can reduce the effect size of the non-significance demographic variables reported. This end implies that, in a way, when the adult learners willingly enroll in ESOL course, which is not compulsory or whatsoever, the individual differences like age, gender, etc. might have a trivial effect on the decision to continue or drop out. Differently, the language placement test score is nontrivial*." (Dahman & Dag, 2019:46).

III. Methodology

a) The contextof The Study

The target population of this study was lifelong learners who enrolled in German Intermediate Language Course offered by Fatih Language School (FLS) from Feb 2019 *until* May 2019. Two teachers participated in recording the findings of the experiment. Each teacher has two groups containing 25 learners for every group. That is in a total of 100 lifelong learners, all of whom were willing to voluntarily participate in the published study. Table (1) demonstrates the demographic distribution of the learners. Noteworthy that, FLS is a lifelong language training center founded by the Metropolitan Municipality of Istanbul, Turkey.

b) Instruments

i. *Demographic Variables:* We collected the information about the lifelong learners' demographic variable (the Placement Test Score) through a brief list that is voluntarily given by the teacher before the beginning of the course. Upon recording the placement test score, a learner profile was properly constructed along with a unique ID number.

Table 1: Demographical Information

Demographic Variables		Type	Learners n=100
Gender	1	Female	60 (60.0%)
	2	Male	40 (40.0%)
Age	1	18-29	66 (70.9 %)
	2	30-39	16 (13.7%)
	3	Over 40	18 (15.4 %)
Marital Status	1	Single	71 (75.2%)
	2	Married	26 (22.2%)
	3	Divorced	2 (1.7%)
	4	Widow	0
	5	Separated	1 (.9%)
Education	1	Pre-High School	0
	2	High School	13 (11.1%)
	3	Vocational School	1 (.9%)
	4	University	72 (76.1%)
	5	Master's Degree	10 (8.5%)

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	6	Ph.D. Doctoral	4 (3.4%)
Job	1	Art & Entertainment	5 (4.3%)
	2	Engineering	8 (6.8%)
	3	Business & Professional Services	8 (6.8)
	4	Construction	1 (.9%)
	5	Education	11 (9.4%)
	6	Finance & Insurance	9 (7.7%)
	7	Food & Services	0
	8	Health & Medicine	5 (4.3%)
	9	Home & Garden	5 (4.3 %)
	10	Students	44 (47.9%)
	11	Other.	7 (6%)
	12	Unemployed	2 (1.7%)
Placement Test	1	A >85	40(40.2%)
	2	B 75-85	47(48.7%)
	3	C 60-74	13(11.1%)

ii. *Affective Variables*: In this study, we employed two instruments, that are used by (Dahman & Dag, 2019) to measure the affective variables.

- The Foreign Language Learning Anxiety Scale (FLCAS), developed by Horwitz et al., (1986) which includes 33 statements, however, we selected 15 items for the study. Each item was rated by the participants using a 5-point Likert scale, in which 1 showed high anxiety and 5 indicated no-anxiety. The average time to fill out the questionnaire was 10 minutes.
- The second instrument is to measure the learner's motivation and attitude score. The questionnaire consists of55-itemsfrom AMTB, the instrument which administered in the study by Dahman and Dag (2019). The six responses: Strongly Disagree (SD), Moderately Disagree (MD), Slightly Disagree (SD), Slightly Agree (SA), Moderately Agree (MA), and Strongly Agree (SA). In case the items were negative in the light of learning German language, the responses were reversed to obtain the final score. The average time to fill out the questionnaire was 30 minutes.
- *Notes:* We assumed that both instruments, which employed in this study, possess a satisfactory level of validity and reliability as reported in Dahman & Dag (2019) study, however, a pilot study was also conducted to measure the reliability of each one. We selected 25 learners at random from the target population. The reliability coefficient test was run by PASW Statistics (Version 18).The values of Cronbach's Alpha were .846 and .851 for FLCAS and AMTB, respectively.

c) *Data Collection and Procedures (Before and After the Course)*

i. *Before the beginning course*

➢ *Data Collection*

- *Step one*: Beginning of the course (Feb. 01.2019) the FLCAS and AMTB, which merged into a single document and divided into two parts, were distributed. Participation in this study was solicited, and data were collected online using Excel Survey - Office 365. The invitation was sent (after acceptance from the participant by telephone) with an introduction. In the introduction, we explained the aim of the study with a respectful and understandable language. On top of that, we asserted the survey was voluntary, and the data would stay confidential.
- *Step Two*: After we collected the data, serious of steps to verify the dataset, such as organizing, cleaning the data, dealing with missing data, and computing total scale scores, were performed.

➢ *Procedure:*

Step One: a mini software that is provided by the author of Dahman & Dag (2019) was provided to calculate the probability of each participant whether to continue or dropout the course. Table (2) illustrates the result predict from the model.

Table 2: result of prediction from the model

Item	Will continue	Will dropout	Total
Number of Learners	84	10	100
% of total sample	84%	10 %	-

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ii. *After the ending of the course*

By the end of the course (May. 10.2019) We asked the school management to advise the final status of each learner from the 100-sample size. Of the 100 participants, 88(88.00%) were continuations while 12(12.00%) were dropouts. Table (3) illustrates the result.

Table 3: Actual result after the ending of the course

Item	Continued	Dropout	Total
Number of Learners	88	12	100
% of total sample	88%	12 %	100%

IV. Result and Discussion

From the result of Table (2) and Table (3), we can see that the accuracy of the model to predict the continuation as accurate as 95.4%. and for the dropout as accurate as 83.3%. Table (4) illustrates the result. This result implicates and overall accuracy of the proposed model of 94%. That's in tandem with the finding of the original work of proposing the model in other language that is ESOL. As the expectation indicated the accuracy of prediction.

Table 4: Actual result verse the mis-labelled data

Item	Continue	Dropout	Total
Continues	84	4	88
Dropout	2	10	12
			100

V. Conclusion

Overall, this study has adopted a predictive model by Dahman & Dag (2019). The original work has been done to predict the decision by adult learner to continue ESOL course. We have typically implemented the proposed model, from the original work, into another language setup that is the German language. In the study, we carried out an experimental approach where the data were carefully collected over two completed phases, before the starting and after ending the course. The result typically shows the model, by Dahman and Dag (2019), accurately predicted 94% of the lifelong learners' decision to continue or drop out of the course. That typically shows that such a model is good to be adopted in a language classroom to help teachers and managers to aid those who are merely at risk to drop out the course.

VI. Limitation and Further Study

It must be born in mind that the study has been done at limited time and resources. In future work, the study can be better adapted for a broader sample and at multiple institutions at the same time. In this manner, the result of the study can't be generaliz able however can represent a base for further and future work.

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