ACADEMIC JOURNALS
expand your knowledge

Educational Research and Reviews

Full Length Research Paper

Determinants of students' vulnerability to attrition in higher education: Evidence from Arba Minch University, Ethiopia

Fassil Eshetu*, Adem Guye, Getahun Kelemework and Sileshi Abebe

Department of Economics, College of Business and Economics, Arba Minch University, Ethiopia.

This study aimed at assessing the level and determinants of students' vulnerability to attrition in Arba Minch University, Southern Ethiopia using a random sample of 547 students. The study revealed that, out of 547 sample students, 207 (38%) students were found highly vulnerable to attrition, 51 (9%) students were moderately vulnerable and the remaining 289 (53%) were not vulnerable. From highly vulnerable categories of students, 132 (64%) were female, while 75 (36%) were male students. With respect to place of origin, out of 207 highly vulnerable students, 119 (57%) of students were from rural areas where as 88 (43%) of students were from urban areas. In addition, 40% of students who were placed to a study program without their interest were highly vulnerable. The study also revealed that first year students are more likely vulnerable to attrition than second and third year students. Logistic regression result revealed that gender, students' satisfaction, study hours, monthly income and faculty of study significantly affect students' vulnerability to attrition. So, to reduce the number of unfinished degrees and reduce vulnerability to attrition, leaders of higher institution should give due attention to students' program placement, tutorials for female students and provision of better student services.

Key words: Attrition, vulnerability, logit model, higher education.

INTRODUCTION

Education is a development of physical, mental, moral (spiritual), and social faculties of individuals, for a life of dedicated service (Eshetu, 2002). It is a powerful tool to enable citizens to make all rounded participation in the development campaign (Tiruneh and Petros, 2014). It is important in raising the productivity of a nation and hence can be seen as vital components of growth and development (Todaro and Smith, 2012). Education is the means or the tool that any society has to possess for

confronting the current and future socio economic challenges, and indeed to shape our world of tomorrow (UNDP, 2007). Therefore, education is a prime objective of every one (Egenti and Omoruyi, 2011).

The relationship between education and economic development has been recognized in the literature. There are two important points in this regard. According to Gyimah-Brempong (2010) education is seen a product of development process on one hand. Education is a central

*Corresponding author. E-mail:bekatfech@gmail.com.

place in accelerating the development of economies through knowledge, skills and attribute change. It affects economic growth, poverty and inequality reduction, health improvement, good governance, institutional development and policy framework (Muhdin, 2016) and (World Bank, 2008). Students are the most essential asset in any educational system. The students' performance plays an important role in producing the best quality graduates who will be become great leader and manpower for the country thus responsible for country's economic and social development (Ali et al., 2009). The schools, colleges and universities are for purpose of enabling the students acquire necessary skills and knowledge to participate in the development process (Mushtaq and Khan, 2012) and (Horn, 2014). As estimated by Pascarella and Terenzini (2005) an increase in one letter grade was associated with an increase in earnings between 8 and 9%. Students with exceptionally poor academic performance may face academic probation, enrollment restrictions, or institutional expulsion (Horn, 2014).

The issue of academic performance has received a considerable attention in any academic programs (Mushtaq and Khan, 2012; Mutairi, 2011). In order to succeed students must place a certain value on academic achievement (Soule, 2009). Thus, due attention has been given for students' academic performance. However, measuring academic performance is a challenging aspect of literature (Mushtaq and Khan, 2012). Besides, factors determining the student's academic performance is vary from place to place (Ali et al., 2013), from person to person and from country to country (Mushtaq and Khan, 2012) and become one of a long standing and ongoing debate among educators, academics, and policy makers (Harb and Sharawi, 2006; Sarwar and Sarwar, 2012).

One of the greatest assets of a country is its youth; more educated youth can contribute more to the country (Zaheer et al., 2016). If youth are effective and successful in education, they can play a significant role to the development of science and technology of any nation (Gota, 2012). It is empirically proved that those who have a graduate degree can find job more easily than their non-graduate counterparts (Richard and Parker, 2012). This did not only enables them to earn for themselves but also prevent them from becoming a burden on nation's economy (Zaheer et al., 2016). However, recent evidences confirm that higher education institutions have given more attention towards attracting new students than retaining the already involved students (Zemke, 2000 cited in Zaheer et al., 2016) and this results high attrition and drop out of the students. As cited in Njoroge et al. (2015), Tinto (1975) has defined student attrition as the process of interactions between individual, academic and social systems of the university which determine whether students are retained or drop out. Attrition is considered as a departure from all forms of higher

education before completion of degree or other credential (Johnson, 2012). To Rilwani et al. (2014), attrition is the declining level of student retention in a given subject or course of study. According to Hussain and Khader (2014) student attrition is a flow out of the students from the institutions through course change, illness and so on. Attrition refers to the proportion in particular year that neither graduate nor continued studying the following year (Daniel, 2014) and it provides a measure of the proportions of students who drop out of institution each year (Rendon et al., 2000). Recently attrition rate is considered as a measure of quality of higher institutions in conjunction with the other measures (Daniel, 2014). Student attrition has upsetting and costly impacts (Hussain and Khader, 2014) and it has drawn a considerable attention globally and nationally in colleges and universities (Brockett, 2002) due to negative consequences it has on individual students' lives, their families and a country's economies (Njoroge et al., 2015). The result of attrition is a large number of unfinished degrees which have a cost for country, the students and the universities concerned, Schneider (2010), Rumberger and Lamb (2003) and Braunstein et al. (2006).

The causes of student attrition are multifaceted and include factors internal to the students and external factors in various environments including family and institutions (Njoroge et al., 2015). A number of studies have identified student's academic background and academic school experiences as a major determinants of student attrition (Hussain and Khader, 2014; Zaheer et al., 2016; Jiranek, 2010; Daniel, 2014; Helen, 2010). Other studies considered personal problem, university environment and economic problems as factors for high attrition rate in academic institution (Yeshimebrat et al., 2009; Daniel, 2014). There are also studies suggesting parental support factors as the major determinants of student attrition (Islam, 2014; Njoroge et al., 2015).

Higher education is of paramount importance for development since it expands people's productive capacity as well as national capacity and competitiveness (Ademe and Singh, 2015). Evidences revealed that higher education enrollment statistics in Ethiopia has been growing from time to time due to strong emphasis of the government on the sector. Moreover, the government has been striving to ensure that some disadvantaged members of the society get access to higher education institutions (Tsehaye and Yesuf, 2013). In addition due to formulation of national policy for Ethiopian women in 1993 (TGE, 1994 cited in Helen, 2010) and permission to enter higher education with lower score than required for male (Beyou, 2003 cited in Helen, 2010) number of females entering higher education institutions are dramatically increasing from time to time. However, none is more serious and persistence than poor academic achievement and subsequent academic dismissal of students especially first year students in Ethiopian higher institutions (Gota, 2012). Dropout rate in Ethiopian

universities was between 10 and 15%, Yalew (2003), Gota (2012), (Semela, 2007) and (Fentaw, 2001 cited in Gota, 2012). Disaggregated studies by gender revealed that higher attrition rate is observed for female students than male students in Ethiopian universities, Yeshimebrat et al. (2009) and Semela (2007).

There are various literatures which examine the determinants of students' academic performance at higher institutions. According to Bean (1980), socio-economic factors, students backgrounds, place of residences (rural-urban), organizational factors, opportunity costs of study and staff-student relationship are important in affecting students' academic performance. Tinto (1975) argued that academic and social integration are important factors against student attrition at university. Moreover, studies by Johnson (2008), Hoffman et al. (2002), Willcoxson et al. (2011) and Leveson et al., (2013) revealed that aside from academic and social integration, attrition has also been shown to be linked to prior academic performance, engagement with faculty and students, financial problem and lack of commitment to study.

Willcoxson et al. (2011) also noted that attrition in the first year of study could result from different reasons as compared to attrition in later years of study. Specifically, Willcoxson et al. (2011) noted that personal factors, such as the lack of academic or social integration are more influential in first year attrition, while institutional factors, such as teaching quality and staff-student interactions are more crucial in determining attrition in later years. Another important finding from Willcoxson et al. (2011) study is the strong association between first year students' expectation of the institution and intention to leave. Hence, first year students were found to be sensitive to factors such as the availability and approachability of teaching staff and empathy shown. In the second and third year, academic confidence appears to be of paramount consideration in students' intention to leave their studies.

Regarding the link between students' satisfaction and their academic performance, Yorke (2000) and Pike (1991) pointed that, students' satisfaction measures as a predictor of academic performance as measured by grades or marks. They found that satisfaction exerts strong influences over grades rather than the other way around. In the relatively few studies that examine the influence of student satisfaction on grades or academic performance, findings that more satisfied students perform better in their grades are common (Grayson, 2004).

Survey of previous studies shows that there are some studies focused on attrition and its determinants in higher education institutions using descriptive analysis (Njoroge et al., 2015; Daniel, 2014; Wudu and Getahun, 2009; Yeshimebrat et al., 2009; Helen, 2010; Zaheer et al., 2016; Roque et al., 2013; Tiruneh and Petros (2014); Griswold, 2014; Fowler, 2016; Rilwani et al., 2014;

Brockett, 2002; Ishitani, 2006; Hannah, 2010; Willging and Johnson, 2004; Fisher and Engmann, 2009; Hussain and Khader, 2014; Geisinger and Raman, 2013; Rodan, 2001; Harvey and Luckman, 2014; Tsehaye and Yesuf, 2013). Most of these studies took a sample of already dropped, dismissed or re-admitted students to achieve their objectives. Answering such question is partially beneficial when concerned with controlling student attrition. The problem is that even if students are not currently dropped, dismissed or re- admitted, they may have high probability of being so in future academic year, a new forward looking concept. Put differently there are some students who are at risk of or endanger of being dropped out of institution due to academic failure even if they are survived in the current semester. These students are said to be vulnerable to academic attrition. Focusing on vulnerability of students to attrition is highly beneficial because it helps minimize the likelihood that a student will be dropped in future academic year through intervention mechanisms. Such critical issue had never been given attention in any of the previous studies. Motivated by this, the present study aimed at examining empirically the phenomenon of vulnerability of student to attrition and its determinants at Arba Minch University using Econometric analysis.

Arba Minch University is one of the 33 Public Universities in Ethiopia established to contribute to the development of the nation and scientific knowledge creation in the world. Since its inception, this university has shown upward trends in all spheres of activities. So, the main objective of the present study is to examine the determinants of Students' vulnerability to attrition in Arba Minch University. Specifically the study was devoted to:

(i) Measure students' level/degree of vulnerability to attrition at higher institution
(ii) Identify the level of students' vulnerability to attrition by gender, place of origin, program placement, batches and faculty
(iii) Examine the determinants of students vulnerability to attrition at higher institution

METHODOLOGY

Description of study areas

Arba Minch University (AMU) is one of the state-owned Universities found in the Southern Nations, Nationalities and People's Region (SNNPR). It is located at Arba Minch town, 500 km south of Addis Ababa. The main campus of the university is situated at the eastern foot of Gamo mountain ranges and adjacent to the vast low land stretching towards Lake Abaya and Lake Chamo, which form part of the East African Rift Valley. The University was established in June 2004 in the premises of the former Arba Minch Water Technology Institute (AWTI), which was established in 1986 with the objective of producing trained professionals in the field of water resources.

The University has a total of 31870 undergraduate, 2160 second degree and 24 PhD students in all its programs and campuses,

(Arba Minch University report, 2016). This makes the total number of students 34,054 attending their education in regular, summer, weekend/evening and distance education modes. The university is functioning in six campus premises and is offering 69 undergraduate and 82 postgraduate (73 masters 9 PhD) program in 52 departments. The present study is conducted at Chamo Campus of Arba Minch University by taking two collages (College of Business and Economics and College of Social Sciences and Humanities) and two Schools (School of Law and School of Pedagogical and Behavioral Science). According to Arba Minch University report in 2016 G. C, there were a total of 3784 under graduate regular students majoring in different fields of the study in two colleges and two schools. The data for the present study depends on primary and secondary sources. The primary data includes information about student satisfaction from the various services provided by the Campus such as teaching and learning related services, cafeteria, dormitories, class rooms, campus administration, library and ICT and clinic related services. It was collected using five point liker scale questionnaire ranging from strongly disagree (1) to strongly agree (5). But, secondary data concerning students CGPA and attrition was collected from registrar office of the Campus.

Sampling techniques and sample size determination

The participants of the study were chosen from two colleges and two schools in Chamo campus namely, college of business and economics, college of social science, school of law and school of pedagogical and behavioral science. To insure representativeness, total samples of 547 students were selected using proportionate sampling techniques. Accordingly a sample of 337 students were taken from college of Business and Economics while 210 students were selected from Colleges of Social sciences and Humanities, school of law and school of pedagogical and behavioral science. Finally, sample respondents were randomly selected from nine departments.

Empirical model specification

This study aimed at examining the determinants of vulnerability of student to attrition. Previous related studies focused on the determinants of student's attrition and they relied on descriptive analysis. In this study student vulnerability to attrition is defined as the probability being dismissed or re-admitted in future. It is the ex-ante risk that a student that is currently retained will be re –admitted or dismissed. The assessment of vulnerability is helpful in that it determines those students who are in danger of being readmitted or dismissed and factors affecting this risk. First high performing and low performing students will be grouped based on agreed cut off-point. Accordingly the agreed cut-off point or threshold grade is 2.49. This is because it is highly likely that students having CGPA of less than or equal to 2.49 may be at risk of being readmitted or dismissed from the university. A sampled students were dived into two, high performer and low performer. A dummy dependent variable is generated by giving 1 for low performing student and 0 for high performing student. Then logistic model is estimated to determine the determinants of student's academic performance.

$$\ln\left(\frac{Pr(Y_i \leq 2.49)}{Pr(Y_i > 2.49)}\right) = \ln\left(\frac{P}{1-P}\right) = Z_i \tag{1}$$

The ultimate outcome of our calculations is a set of estimates V_i of the probability that each student will be dismissed or re admitted in future. The estimate of vulnerability for each student takes values in the interval [0, 1]. At the extremes the estimate of V_i can be 0 and 1.

When $V_i = 0$, student will retain in university in future with certainty until graduation; when $V_i = 1$, student will be dismissed or re admitted in future. Since we can attach an index V_i to all students, the question arises which students are considered as vulnerable to attrition in between two extremes. This is particularly important for designing any mitigating interventions so as to reduce the attrition of students. It makes sense to consider students with estimated vulnerability close or equal to unity as "Vulnerable'' and those with a vulnerability index close or equal to zero as'' non-vulnerable''. But as we move towards center of spectrum, the distinction becomes less obvious and the need for arbitrary cut- off point arises. Among many choices of cut-off points, the most commonly used one is 0.5. Finally, the present study estimated the determinants of student vulnerability to attrition by giving 1 for students with $V_i \geq 0.5$ and 0 for students with $V_i < 0.5$ using logistic regression model.

$$\boldsymbol{Vulnerability = X'\beta} \tag{2}$$

Since the dependent variable is dichotomous, this model can be estimated using maximum likelihood estimation and the logistic regression can be specified as follow:

$$Li = \beta0 + \beta1AGE + \beta2MALE + \beta3HRS + \beta4INCOME + \beta5PLACE + \beta6SECOND + \beta7THIRD + \beta8\,PROGRAM + \beta9SAT + \beta10COLLEGE + Ui \tag{3}$$

Where Li, AGE, MALE, HRS, INCOME, PLACE, SECOND, THIRD, PROGRAM, SAT and COLLEGE refer to Logit, age of students, gender of students, daily hours of study, monthly income from family, place of origin (rural and urban), dummy for second year students, dummy for third year students, dummy for program placement (by interest and without interest), general satisfaction of students and dummy for college of students respectively.

The dependent variable (L_i) is a nominal binary variable which assumes values of 1 for students with probability of greater than or equal to 0.5 and 0 value for students with probability of less than 0.5. Dummy for place assumes 1 for students from urban origin and 0 for students from rural origin. Similarly, dummy for program placement assumes 1 for students who were placed by their interest and 0 for students who were placed without tier interest. Finally, dummy for college assumes 1 for students from college of business and economics and 0 otherwise.

RESULTS AND DISCUSSION

This section presents the various results obtained from both descriptive and econometric analysis. The analysis was based on the primary data obtained from 527 students and secondary data obtained from registrar office.

Descriptive data analysis

As indicated in methodology part, secondary data on cumulative grade point average (CGPA) of all students in Chamo campus were collected from registrar office of college of business and Economics and registrar office of college of Social Science so as to determine appropriate sample size. The main objective of this study was to examine the determinants of students' vulnerability to attrition in Chamo campus and in this study, the

Table 1. The distribution of cumulative grade point average by batch of students.

Cumulative GPA of students	Batch of students						Total	
	First year		Second year		Third year			
	No	%	No	%	No	%	No	%
CGPA<=2	41	**18.3**	7	**5**	5	**2.73**	53	**9.69**
2<CGPA<=2.49	44	**19.64**	45	**32.14**	59	**32.24**	148	**27.06**
2.49<CGPA<=3.99	59	26.34	38	27.14	60	32.78	157	28.7
CGPA>=3	80	35.71	50	35.71	59	32.24	189	34.55
Total	224	100	140	100	183	100	547	100

Source: Own Survey, 2017.

Table 2. The distribution of cumulative grade point average by sex of students.

Cumulative GPA	Sex				Total	
	Female		Male			
	Number	%	Number	%	Number	%
CGPA<=2.00	25	13	28	8	53	10
2.00<CGPA<=2.49	81	41	67	19	148	27
2.49<CGPA<=3.99	50	25	107	31	157	29
CGPA>=3.00	41	21	148	42	189	35
Total	197	100	350	100	547	100

Source: Own Survey, 2017.

researchers defined students with CGPA of less than or equal to 2.49 as low performing student or vulnerable to attrition. As evidenced in Table 1, about 36.75% of the total sample students in Chamo campus have CGPA of less than or equal to 2.49 and therefore, they are vulnerable to attrition. Moreover, about 9.69% of the total sample students in Chamo Campus have CGPA of less than 2.00 and they are first year students. As noted in Table 1, from the total sample students in this study, 34.55% of students have CGPA of greater than or equal 3.00 while 28.70% of students have CGPA between 2.49 and 3.00. This study also tried to see vulnerability by years of stay in the campus and gender using survey data on cumulative GPA of students.

Table 1 revealed that first year students are more likely to be vulnerable to attrition than second year students and second year students are also more likely to be vulnerable to attrition compared to third year students. From a total sample of students, 224, 140 and 183 students were selected from first year, second year and third year students. The result implies that vulnerability to attrition decreases as years of stay in the campus increases. This study showed that 18.30% of first year students scored less than or equal to 2.00 points out of 4.00 points while 5 and 2.73% of second year and third year students scored less than or equal to 2.00 points respectively. By implication, as experience increases, students' vulnerability to attrition decreases.

This study also compared the performance of sample students by gender as presented in Table 2. In this study, from a total of 547 sample students, 197 (36%) students were female while 350 (64%) were male students. Data on cumulative GPA of sample students were categorized in to four categories as shown in Table 2. Accordingly, from a total of 197 female students, 25 (13%) of them scored a cumulative GPA of less than or equal to 2.00 whereas from a total of 350 male students, 28 (8%) of them scored a cumulative GPA of less than or equal to 2.00. Similarly, a cumulative GPA of 41 and 19% of female and male students respectively found between 2.00 and 2.50 point. The result revealed that female students are more vulnerable to attrition compared to male students in Chamo Campus. According to student integration model, the basic factors which affect student attrition includes student charactertics and program charactertics, Tinto (1975). According to Hirschy et al. (2011), race, ethnicity, gender, age, parental education level, ability to pay, and domestic partner status can affect student's attrition. So, colleges/ School leaders should properly manage female student's tutorials so as to raise their performance and reduce their vulnerability to attrition. Finally, the study also compared the performance of students by college of students and the result was presented in Table 3.

As noted from Table 3, from a total 547 students, 189 students scored a cumulative GPA between 3.00 and

Table 3. The distribution of cumulative grade point average by faculty of students.

| Cumulative GPA | College of Students | | | | Total | |
| | Social Science and Humanity[a] | | Business and Economics | | | |
	Number	%	Number	%	Number	%
CGPA<=2	15	7	38	11	53	10
2<CGPA<=2.49	49	23	99	29	148	27
2.49<CGPA<=3.99	54	26	103	31	157	29
CGPA>=3	92	44	97	29	189	35
Total	210	100	337	100	547	100

Source: Own Survey, 2017. [a]College of Social Science and Humanity also includes School of Law and School of Pedagogical and Behavioral Science.

4.00. From a total 210 sample students from college of social science and humanity, 92 (44%) of them scored a cumulative GPA of 3.00 and above whereas from a total 337 sample students from college of business and economics, 97 (29%) of them scored a cumulative GPA of 3.00 and above.

By contrary, from a total sample students from college of social science and humanity, 15 (7%) of them scored a cumulative GPA of less than or equal to 2.00 while from a total sample students from college of business and economics, 38 (11%) of them scored a cumulative GPA of less than or equal to 2.00. Characteristics of a program such as its resources, facilities, structural/organizational arrangements, and its members that can limit or facilitate the development and integration of individuals within the institution or program can affect student's attrition and attrition is often the result of the interaction between student and program characteristics (Tinto, 1975). That is, student integration into the program, from an academic and social perspective, is often needed to achieve student success (Dodge et al., 2009; Tinto, 1975; Wells, 2003; Wells, 2007 and Pascarella and Terenzini, 1977).

According to Wells (2007) and Dodge et al. (2009), students frequently find that their expectations of what a program will entail do not match up with what they actually experience once in the program and this type of disillusionment has been found to be a contributing factor to student attrition and students that believe that they have made the right program choice tend to have higher levels of motivation which is, in turn, lead to lower attrition rate.

In the study area, most students joined business and Economics College by assuming there is no quantitative courses and when they actually joined the program, they may found a mismatch between their expectation and what is on the ground. Moreover, staff experience is higher in college of social science and humanities compared to business and Economics College. This is because, there is higher staff turnover in college of business and economics due to better job opportunities in other sectors of economy for them. All these, may account for higher students' attrition at college of business and economics compared to college of social science and humanities.

In addition, from a total 210 sample students from college of social science and humanity, 64 (30%) of them scored a cumulative GPA of less than or equal to 2.49 while from a total 337 sample students from college of business and economics, 137 (41%) of them scored a cumulative GPA of less than or equal to 2.49.

Logistic regression

To classify the students in Chamo campus as highly vulnerable, moderately vulnerable and not vulnerable to attrition depending on the predicted probability of being dismissed or re-admitted in the future, two vulnerability thresholds were used following Chaudhuri et al. (2002). These two thresholds are the average vulnerability which is equal to the percentage of students whose CGPA is less than or equal 2.49 from the total sample students (0.3565) and 0.5. By using these two thresholds, sample students were classified as highly vulnerable if the predicted probability of being dismissed or re-admitted in the future is greater than 0.5, less vulnerable if the predicted probability of being dismissed or re-admitted in the future is between the average vulnerability (0.3565) and 0.5 and not vulnerable if the predicted probability of being dismissed or re-admitted in the future is less than the average vulnerability (0.3565).

Table 4 revealed that from a total of 337 sample students of college of business and economics, 142 (42.34%) students were highly vulnerable to attrition while from a total of 210 sample students of college of social science, school of law and school of pedagogical science, only 65 (30.095%) of students were highly vulnerable to attrition. That means, from the total 547 sample of students, 207 students are highly vulnerable to attrition. But, from these highly vulnerable students, 132 (64%) were female students while 75 (36%) were male students. This implies that, female students were more vulnerable to attrition in Chamo Campus compared to their male counterpart. From the total of 207 highly

Table 4. Students' vulnerability to attrition by sex, place of origin and program choice.

Variable		Non-vulnerable (289)	Moderately Vulnerable (51)	Highly Vulnerable (207)	Total
		V≤ 0.3565	0.3565 <V< 0.50	V≥ 0.50	
SEX	Male	**240**	35	75	350
	Female	49	16	**132**	197
PLACE	Urban	112	17	88	217
	Rural	177	34	**119**	330
PROGRAM	Interest	232	40	161	433
	Without Interest	57	11	46	114
COLLEGE	CBE	159	36	**142**	337
	Social	130	15	65	210

Source: Own Survey, 2017.

vulnerable students, 119 (57%) of students were from rural areas where as 88 (43%) of students were from urban areas. So, students with rural origin are more vulnerable to attrition than students from urban origin.

Regarding program placement 114 (21%) students responded that they were placed to a program or department without their interest and of these, 46 (40%) students were highly vulnerable to attrition. But, from 433 students who were placed to a program by their interest and161 (37%) of students are highly vulnerable to attrition. Thus, students who were placed to departments without their interest are more vulnerable to attrition as evidenced by this study. From the total of 547 students, 289 (53%) of students are not vulnerable, 51 (9%) students are moderately vulnerable and 207 (38%) of students are highly vulnerable to attrition. Students with rural origin, female students, students who were placed to program without their interest and students from college of business and economics are more vulnerable to attrition in Chamo Campus.

In the first semester of 2009 E. C, from a total of 547 students there were 195 (35.65%) students whose cumulative GPA was less than or equal to 2.49. But, analysis of vulnerability revealed that 207 students are vulnerable to attrition or have high probability of getting cumulative GPA of less than 2.49. This means, 12 (2.2%) students were not vulnerable in the first semester of 2009 E.C, but they are vulnerable to attrition in the second semester of 2009 E. C. Therefore, vulnerability analysis is very important for forward looking policy targeting than mere dependence on the ex-post attrition measure. As the study revealed, the proportion of vulnerable students 207 (38%) is greater than the proportion of currently low performing students [1]195(35.65%).

_____
[1] Low performing students are those students whose cumulative GPA is less than or equal to 2.49.

Econometric data analysis

To examine the possible determinants of students' vulnerability to attrition, the vulnerability index is used to categorize students as highly vulnerable and low vulnerable. That means, if the vulnerability to attrition is greater or equal to 0.5, the students is categorized as high vulnerable which takes the value of 1 and 0 if the vulnerability index is less than 0.5 for the students. Then, this dummy variable is regressed on all explanatory variables of the model to determine the relative strength of each variable in affecting vulnerability (the probability of being dismissed or re-admitted) using the logistic estimation. Vulnerability analysis has a paramount importance in identifying not only the currently poor performing students, but also those students who are more likely to be dismissed or re-admitted in the near future. Thus, this study classified students in to highly vulnerable and less vulnerable using thresholds of 0.5 and examined the determinants of vulnerability of students to attrition in Chamo Campus using logistic regression. The dependent variable is a dummy variable which is obtained from the vulnerability level of each student. The dependent variable assumes value of 1 if the students' level of vulnerability to poverty is greater than or equal to 0.5 and 0 if the students level of vulnerability is less than 0.5. The logistic regression result of the determinants of vulnerability of students to attrition is presented in Table 5 Below. The dummy dependent variable regressed on all age, hours of study per week, monthly income from family, overall satisfaction of students from various services, dummy for sex, dummy program placement, dummy for batch of students and college of students. Accordingly the determinants of students' vulnerability to attrition measured using logistic regression model and the result is presented in Table 5. The coefficients of Logit model showed that students' vulnerability to attrition is statistically significantly affected

Table 5. Logistic Regression of the determinants of students' vulnerability to attrition.

		Number of Observation = 547		
Log Likelihood	**-268.442**	**LR chi^2 (10) =175.72**		
		Prob>chi^2 =0.0000		
		Pseudo R^2 = 0.2466		
Variables	**Coefficients**	**Standard Error**	**Z**	**Probabilities**
Age	-0.0401	0.0749	-0.54	0.592
Sex	-1.0073	0.2341	-4.30	0.000
Income	-0.0013	0.0006	-2.20	0.028
Place	-0.2275	0.2245	-1.01	0.311
Program	-0.2626	0.2701	-0.97	0.331
Second	-0.1117	0.2690	-0.42	0.678
Third	-0.2831	0.2984	-0.95	0.343
Satisfaction	-0.3941	0.1613	-2.44	0.015
Hours	-0.4187	0.0485	-8.63	0.000
College	0.8112	0.2409	3.37	0.001
Constant	1.9763	1.6233	1.22	0.223
Link test		$Vulnerability = 0.0095 + 0.9858\hat{y} - 0.0110\hat{y}^2$		
		$Z\_value = (0.08) \quad (7.93) \quad (-0.18)$		
Variance Inflating Factor (VIF)			1.20	
Average students' vulnerability to attrition			0.3565	

Source: Own Survey, 2017.

Table 6. Marginal Effect after Logistic regression of Students' vulnerability to attrition.

Variables	**Marginal Effect**	**Standard Error**	**Z**	**Probability**
AGE	-0.0081	0.0150	-0.54	0.591
SEX	-0.2119	0.0503	-4.21	0.000
INCOME	-0.0003	0.0001	-2.24	0.025
PLACE	-0.0452	0.0440	-1.03	0.305
PROGRAM	-0.0544	0.0567	-0.94	0.345
SECOND	-0.0221	0.0526	-0.42	0.674
THIRD	-0.0556	0.0573	-0.97	0.331
SATISFACTION	-0.0792	0.0325	-2.44	0.015
HOURS	-0.0841	0.0087	-9.64	0.000
COLLEGE	0.1553	0.0432	3.59	0.000

Source: Own Survey, 2017.

by gender, income, hours of study, general satisfaction and faculty of study. As indicated in Table 5, sex negatively and statistically significantly affects students' vulnerability to attrition at 1% level of significance. In other words, female students are more vulnerable to attrition. This study also revealed that second year and third year students are more vulnerable to attrition compared to third year students though statistically insignificant.

Regarding the relationship between students' satisfaction and vulnerability to attrition, the result from Table 6, revealed that higher students' satisfaction is associated with lower students' vulnerability to attrition. So, satisfaction of students from various services in university may positively affect their academic performance. Study by Zoran (2016), Muhammad (2015) and Nara (2014) confirmed that student's satisfaction with University services affect student performance positively. It is believed that the relationship between students' vulnerability and monthly income from family is positive because money can buy you all the comforts that you need to concentrate on your studies, Radner et al. (1975), Bennett (2003), Jackson (1978) and Wells (2007). The result of this study revealed that students

belonging to more affluent family are less vulnerable to attrition as the coefficient of income from family is negative and statistically significant at 1% level of significance. Using data from a sample of 547 students, the results in Table 5 suggest that longer hours of study per week is associated with lower vulnerability of students to attrition.

As shown in Table 6, the probability of being highly vulnerable to attrition of male students is less than that of female students by 21.19%. Hence, female students have more vulnerability to future attrition than male students. According to studies conducted by Mersha (2009), Astin (1993), Prince, (1993), Egenti and Omoruyi (2011) and Eshetu (2002), as the grade level in higher institution increases, the number of female students starts to decline because of lots of factors and consequently, higher education remains an area of learning from which women are less represented. The very few women that are fortunate enough to join higher institutions are characterized by lower academic performance and higher forced withdrawal.

The coefficient of monthly income from family has negative sign and statistically significant at 5% level of significant. In other words, higher monthly income from family reduces vulnerability of students to attrition as presented in Table 6. Though statistically insignificant, students with urban origin were less vulnerable to attrition compared to students with rural origin. The studies conducted by Li et al. (2015), Lim (2015) and Coates and Edwards (2009) found that despite the rapid rise in participation of students from disadvantaged areas in higher education in recent years, their degree completion rates still lag behind those of their fellow students from more privileged or urban areas. More importantly, the overall satisfaction of student from the various services has negative and statistically significant effect on students' vulnerability to attrition. Studies conducted by Grayson (2004), Bean and Bradley (1986) and Pike (1991) found that there are strong association between students satisfaction from the various services provided in higher institutions and the academic performance of students. That means, most of the study revealed that more satisfied students perform better in their grades.

By implication, higher satisfaction from various services in university increases student retention and reduces students' vulnerability to attrition. So, raising the standard of services provision may raise students' satisfaction and thereby, reduce students' vulnerability to attrition in University.

Regarding the coefficient of hours of study per week, it affects students 'vulnerability to attrition negatively and significantly. This implies that as hours of study per week increases by one hour, student's vulnerability to attrition decreases by 8.41% as indicated in Table 6. So, students' effort or commitment or determination has a paramount important in improving their performance and thereby reduce their vulnerability to attrition.

As noted in Table 6, faculty of students has significant effect on students' vulnerability to attrition. Dummy for college is defined as 1 for students from college of business and economics and 0 other wise. The coefficient of college dummy is positive and statistically significant at 1% level of significant. That means, vulnerability to attrition for students from college of business and economics is higher than the vulnerability of students from college of social science and humanity, school of law and school of pedagogical and behavioral science by 15.53%. In other words, students from college of business and economics are more vulnerable to attrition compared students from other college and schools. This difference in vulnerability may be due to the differences in experiences of staff, staff to student ratio and nature of the disciplines. This result is in line with the studies conducted by Cardak and Vecci (2013) and Marks 2010) which classified the determinants of students vulnerability to attrition at higher institutions in to personal characteristics, prior academic performance and university characteristics (field of study and academic support programs). Finally, the diagnostic test results of the Logit model shows that there is no problem of Multicollinearity as the mean value of variance inflating factor (VIF) is 1.20 which is less than 10. The link test which can be used to check the existence of model miss-specification revealed that there is no problem of model miss-specification as the coefficient of $\hat{y}$ is statistically significant.

CONCLUSION AND RECOMMENDATIONS

Students are the most essential asset in any educational system. The overall economic development of a country depends on academic performances of the students. The students' performance plays an important role in producing the best quality graduates who will become great leader and manpower for the country thus responsible for country's economic and social development.

This study aimed at assessing the level and determinants of students' vulnerability to attrition at Arba Minch University, Southern Ethiopia using survey data from a sample of randomly drawn 547 students. The study found that students' vulnerability to attrition decreases with an increase in their experience in the Campus. That means, first year students are more likely to be vulnerable to attrition than second year and third year students. With regard to students GPA 25 (13%) of female sample students and 28 (8%) of male sample students scored a cumulative GPA of less than or equal to 2.00. So, female students are more vulnerable to attrition compared to male students in Chamo Campus.

This study also revealed that from a total of 337 sample students from college of business and economics, 142 (42.34%) of students are highly vulnerable to attrition

while from a total of 210 sample students from college of social science, school of law and school of pedagogical science, only 65 (30.095%) of students are highly vulnerable to attrition. That means, from the total 547 sample of students, 207 students are highly vulnerable to attrition. But, from these highly vulnerable students 132 (64%) are female students while 75 (36%) are male students. This implies that, female students are more vulnerable to attrition in Chamo Campus compared to their male counterpart. As indicated in this paper, students with rural origin are more vulnerable to attrition than students from urban origin. Similarly, students who were placed to departments without their interest are more vulnerable to attrition as evidenced by this study.

In this study, out of 547 sample students, 289 (53%) of them are not vulnerable, 51 (9%) students are moderately vulnerable and 207 (38%) of students are highly vulnerable to attrition. Regarding the determinants of students' vulnerability to attrition, coefficient of sex is negative and statistically significant at 1% level of significance and this implies that male students were less vulnerable than female students. More importantly, the general satisfaction of student from the various services, hours of study per week, monthly income from family are negatively and statistically significantly affect students' vulnerability to attrition. Higher hours of study per week will raise students' confidence and lead to better performance. So, students' effort or commitment or determination has a paramount important in improving their performance and thereby reduce their vulnerability to attrition. The coefficient of college dummy is positive and statistically significant at 1% level of significant. That means vulnerability to attrition for students from college of business and economics is higher than the vulnerability of students from other college/schools by 15.53%.

Based on key results of the study, the researchers identified some areas for interventions in order to reduce the number of unfinished degrees (attrition) and increase the quality of graduates. The study found that female students are relatively more vulnerable to attrition and therefore, there is a need to provide tutorials classes for female and less performing male students. There is higher staff turn-over in college of business and economics and this leads to lower staff to student ratio and thereby, greater staff work overload. Due to this, course instructor may not have enough time to give tutorial for female and low performing male students. So, it would be better if tutorials for female and low performing students will be given by students with better cumulative GPA and assistant graduates. This study found that those students who were placed to program/ department without their interest were more vulnerable to attrition than students who were placed by their interest. So, college/ school leaders have to give due attention to students' program placement and reduce the number of students who will be assigned to program without their interest.

According to Central Statistical Authority (2014), about 22% of the total population in Ethiopia is living below poverty line and therefore, it would be common to see students with financial problem in universities. Since this study revealed significant effect of monthly income from family on students' vulnerability to attrition, colleges/ schools have to devise methods so as to help students with financial problem and thereby, reduce their vulnerability to attrition. Colleges/ schools have to work hard so as to improve staff to student ratio as this definitely affect students' academic performance. Motivating and cultivating the reading habit of students through availing up to date books, advising, giving routine exercises, allowing them to celebrate reading day at university level and the like have paramount importance to reduce students' vulnerability to attrition in higher institution. As indicated in this study, students' level of satisfaction from the various services in university reduces students' vulnerability to attrition. So, improving the standard of service provisions in higher institution may increase students' motivation, aspiration, and academic performance and thereby, reduce the number of unfinished degrees/vulnerability to attrition.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

ACKNOWLEDGEMENTS

REFERENCES

Ademe G, Singh M (2015). Factors Affecting Women's Participation in Leadership and Management in Selected Public Higher Education institutions in Amhara Region, Ethiopia. European Journal of Business and Management. ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online). 7:31.

Ali N, Jusoff K, Ali S, Mokhtar N, Salamt AA (2009). The Factors Influencing Students' Performance at University Technology MARA Kedah, Malaysia. Canadian Research and Development Center of Sciences and Cultures 3:4.

Ali S, Haider Z, Munir F, Han H, Ahmed A (2013). Factors Contributing to the Students' Academic Performance: A Case Study of Islamia University Sub-Campus. Science and Education Publishing, American Journal of Educational Research 1(8):283-289.

AL-Mutairi A (2011). Factors Affecting Business Students' Performance in Arab Open University: The Case of Kuwait. International Journal of Business and Management 6(5):146-155.

Arba Minch University report (2016). Third quarter report of Arba Minch University, Ethiopia.

Astin HS (1993). Women and Achievement: Occupational Entry and

Persistence. Paper presented at the Eastern Psychological Association.

Bean JP (1980). Dropouts and turnover: The synthesis and test of a causal model of student attrition. Research in Higher Education 12(2):155-187.

Bean JP, Bradley RK (1986). Untangling the Satisfaction-Performance Relationship for College Students. The Journal of Higher Education 57(4):393-412.

Bennett R (2003). Determinants of undergraduate student drop out rates in a University. Journal of Further and Higher Education 27(2):123-141.

Braunstein A, Lesser M, Pescatrice D (2006). The business of student retention in the post September 11 environment-financial, institutional and external influences. The Journal of American Academy of Business, Cambridge 8(1):134-141.

Brockett SA (2002). Factors Influencing Attrition and Retention of Female Students in the College of Engineering. Electronic Theses and Dissertations. P 496.

Cardak B, Vecci J (2013). Catholic School Effectiveness in Australia: A Reassessment Using Selection on Observed and Unobserved Variables, Economics of Education Review 37(1):34-45.

Central Statistical Authority (2014). Ethiopian Mini Demographic and Health Survey, Addis Ababa. Economics of Education Review 37(1):34-45

Chaudhuri S, Jalan J, Suryahadi A (2002). Assessing Household Vulnerability to Poverty: A Methodology and Estimates for Indonesia, Columbia University Department of Economics Discussion Paper No. 0102-52. New York: Columbia University.

Coates H, Edwards D (2009). The 2008 Graduate Pathways Survey: Graduates' Education and Employment Outcomes Five Years after Completion of a Bachelor Degree at an Australian University, Higher Education Research P 12.

Daniel TS (2014). Attrition causes among university students: the case of Gondar University, Gondar, North West Ethiopia. Innovare Journal of Social Sciences 2:2. ISSN 2347-5544.

Dodge TM, Mitchell MF, Mensch JM (2009). Student retention in athletic training education programs. Journal of Athletic Training 44(2):197.

Egenti MN, Omoruyi FEO (2011). Challenges of Women Participation in Continuing Higher Education Programme: Implications for Adult Women Counseling and Education. Edo Journal of Counseling 4:1-2.

Eshetu A (2002). Factors Affecting Participation of Females in Secondary in Gambella Region. A Thesis Presented to the School of Graduate Studies of Addis Ababa University. Factors affecting female students' academic achievement and causes of attrition in higher learning institutions of Ethiopia.

Fisher R, Engelmann J (2009). Factors Affecting Attrition at a Canadian College.

Fowler Z (2016). Determinants of Secondary School Attrition and Related Health Factors among Female Youth in Rural Kenya. Global Health Undergraduate Thesis for Distinction, Duke University

Geisinger BN, Raman DR (2013). Why They Leave: Understanding Student Attrition from Engineering Majors. International Journal of Engineering Education 29:4. Printed in Great Britain.

Gota AA (2012). Effects of parenting styles, academic self-efficacy, and achievement motivation on the academic achievement of university students in Ethiopia. Retrieved from http://ro.ecu.au/theses/461

Grayson JP (2004). The Relationship between Grades and Academic Program Satisfaction over Four Years of Study. The Canadian Journal of Higher Education 34(2):1-34.

Griswold CM (2014). Understanding Causes of Attrition of 1st- and 2nd-Year Nursing Students. Unpublished doctoral dissertation, Johns Hopkins University.

Gyimah-Brempong K (2010). Education and Economic Development in Africa. Paper prepared for the 4th African Economic Conference, October 27-29, 2010, Tunis, TUNISIA.

Hannah R (2010). A Longitudinal Assessment of Graduate Student Research Behavior and the Impact of Attending a Library Literature Review Workshop. College & Research Libraries 71(6):532-547.

Harb N, El-Shaarawi A (2006). Factors Affecting Students' Performance in United Arab Emirates. MPRA Paper No. 13621 posted 26. February 2009 04:55 UTC. Available online at http://mpra.ub.uni-muenchen.de/13621/

Harvey A, Luckman M (2014). Beyond demographics: Predicting student attrition within the Bachelor of Arts of degree. The International Journal of First Year in Education 5(1):19-29.

Helen TG (2010). Contributing Factors for Female Students' Attrition in Science Education: The Case of Faculty of Science at Addis Ababa University, Ethiopia. Unpublished Material.

Hirschy AS, Bremer CD, Castellano M (2011). Career and Technical Education (CTE) Student Success in Community Colleges. Community College Review 39(3):296-318.

Hoffman M, Richmond J, Morrow J, Salomone K (2002). Investigating 'Sense of Belonging" in First-Year College Students", Journal of College Student Retention 4:227-256.

Horn AS (2014). Determinants of Student Success: An Integrative Perspective to Orient Policy and Practice. Midwestern Higher Education Compact.

Hussain M, Khader PSA (2014). Analyzing student attrition and retention in Engineering Colleges of South India. International Journal of Data Engineering (IJDE) Singaporean Journal of Scientific Research (SJSR) 6(4):213-218 available at: www.iaaet.org/sjsr

Ishitani TT (2006). Studying attrition and degree completion behavior among First-Generation College students in the United States. The Journal of Higher Education 77(5):861-885

Islam MM (2014). Factors influencing the Academic Performance of Undergraduate Students in Sultan Qaboos University in Oman. Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS) 5(4).

Jackson G (1978). Financial Aid and Student Enrollment. Journal of Higher Education 49:548-74.

Jiranek V (2010). Potential predictors of timely completion among dissertation research students at an Australian faculty of sciences. International Journal of Doctoral Studies 5:1-13.

Johnson I (2008). Enrollment, Persistence and Graduation of In-Site Students at a Public Research University: Does High School Matter? Research in Higher Education 49:776-793.

Johnson N (2012). Institutional costs of student attrition. Delta Cost Project. American Institute for Research.

Leveson L, McNeil N, Joiner T (2013). Persist or Withdraw: The Importance of External Factors in Students' Departure Intentions, Higher Education Research and Development 32(6):932-945.

Li IW, Mahateau S, Dockery AM, Junankar PN, Mavromaras K (2015). Labour Market Outcomes of Australian University Graduates from Equity Groups. A 2015 Student Equity in Higher Education Research Grants Project. National Centre for Student Equity in Higher Education, Perth: Curtin University.

Lim P (2015). Do individual background characteristics influence tertiary completion rates? A 2014 Student Equity in Higher Education Research Grants Project. National Centre for Student Equity in Higher Education, Perth: Curtin University.

Marks GN (2010). What Aspects of Schooling are Important? School Effects on Tertiary Entrance Performance, School Effectiveness and School Improvement: An International Journal of Research, Policy and Practice 21(3):267-287.

Mersha Y, Alemayehu B, Asrat A, Nigussie A (2009), The study of policy intervention on Rural-Urban Migration

Muhammad TAM (2015). Comparison of Students' Satisfaction and Achievement at Secondary Level in Islamabad. American Journal of Educational research 3:12. Science and Education Publishing DOI: 10.12691/education-3-12-7.

Muhdin M (2016). Determinants of Economics Students' Academic Performance: Case Study of Jimma University, Ethiopia. International Journal of Scientific and Research Publications 6(1). ISSN 2250-3153.

Mushtaq I, Khan SN (2012). Factors Affecting Students' Academic Performance. Global Journals Inc. (USA). Global Journal of Management and Business Research 12(9). Version 1.0 June 2012. Online ISSN: 2249-4588 & Print ISSN: 0975-585.3

Nara MM (2014). Student Satisfaction and Academic Performance in Armenian Higher Education. American International Journal of Contemporary Research 4:2.

Njoroge MM, Gichure C, Wang'eri T (2015). Parental Support Factors as Determinants of Student Attrition in Private Universities in Nairobi County. Journal of Emerging Trends in Educational Research and

Policy Studies (JETERAPS) 6(6):460-470 © Scholar link Research Institute Journals, 2015 (ISSN: 2141-6990) jeteraps.scholarlinkresearch.com

Pascarella ET, Terenzini P (1977) Patterns of Student-Faculty Informal Interaction Beyond the Classroom and Voluntary Freshman Attrition. Journal of Higher Education, 48:540-62.

Pascarella ET, Terenzini PT (2005). How college affects student (Vol. 2): A third decade of research. San Francisco, CA: Jossey-Bass.

Pike GR (1991). The Effects of Background, Coursework and Involvement on Students' Grades and Satisfaction", Research in Higher Education 32(1):15-30.

Prince LA (1993). Characteristics of Early Student Dropouts at Allegany Community College and Recommendations for Early Intervention. Cumberland, MD: Allegany Community College. (ED 361 051)

Radner R, Miller LS (1975). Demand and Supply in U.S. Higher Education. New York: McGraw-Hill.

Rendon L, Jalomo RE, Nora A (2000). The theoretical considerations in the study of minority student retention in higher education. Reworking the student departure puzzle, In: J. M. Braxton Nashville: Vanderbilt University Press pp. 127-156

Rilwani ML, Akahomen D, Gbakeji J (2014). Secondary school students' attrition in Geography in Esan West Local Government Area, Edo State, Nigeria: The teachers' perspective. Sky Journal of Educational Research 2(4):028-036. ISSN 2354-4406.Available online http://www.skyjournals.org/SJER

Rodan M (2001). The determinants of student failure and attrition in first year computing science. Computing Science, Glasgow University, project summer.

Roque APD, Sioson JYG, Chelsea MY, Tarrazona YNS, Tolentino GAV, Trinidad Sofia MBD, Calaca NI (2013). Reasons Affecting Attrition in University Of Santo Tomas Faculty of Pharmacy from Academic Year 2010-2013. International Journal of Technology Enhancements and Emerging Engineering Research 2:4. ISSN 2347-4289

Rumberger RW, Lamb SP (2003). The Early Employment and Further Education Experiences of High School Dropouts: a Comparative Study of the United States and Australia. Economics of Education Review 22:353-366.

Sarwar A, Sarwar SM (2012). Factors Having Impact on the Performance of Business Students Case study of Institute of Business and Information Technology (IBIT) University of the Punjab, Lahore, Pakistan International Journal of Business and Social Science 3:17.

Schneider M (2010). Finishing the first lap: The cost of first-year student attrition in America'souryear colleges and universities. Washington, DC:AmericanInstitutes.http://www.air.org/files/AIR_Schneider_Finishing_the_First_Lapo ct10.pd

Semela T (2007). Identification of Factors Contributing to Gender Disparity in an Ethiopian University; Eastern Africa Social Science Research Review P 71593

Soule BJ (2009). Determinants of academic achievement and intention to complete the program among PGA Golf Management students. UNLV Theses, Dissertations, Professional Papers, and Capstones. 124.

Tinto V (1975). Dropouts from higher education: A theoretical synthesis of recent research. Review of Educational Research 45(1):89-125.

Tiruneh WA, Petros P (2014). Factors Affecting Female Students' Academic Performance at Higher Education: The case of Bahir Dar University, Ethiopia. African Educational Research Journal 2(4):161-166.

Todaro MP, Smith SC (2012). Economic Development. Eleventh Edition. Addison-Wesley.

Tsehaye W, Yesuf MA (2013). Determinants of Student Attrition at College of Business and Economics, Mekelle University: Econometric Investigation.

UNDP (2007). New Technologies and the Global Race for Knowledge. Human Development Report 2007. New York: Oxford University Press.

Wells MI (2003). An epidemiologic approach to addressing student attrition in nursing programs. Journal of Professional Nursing 19(4):230-236.

Wells MI (2007). Dreams deferred but not deterred: A qualitative study on undergraduate nursing student attrition. Journal of College Student Retention: Research, Theory and Practice 8(4):439-456.

Willcoxson L, Cotter J, Joy S (2011). Beyond the First-Year Experience: The Impact on Attrition of Student Experiences Throughout Undergraduate Degree Studies in Six Diverse Institutions, Studies in Higher Education 36(3):331-352.

Willging PA, Johnson SD (2004). Factors that influence students' decision to drop out of online courses. JALN 8(4).

World Bank (2008). Higher Education Development for Ethiopia: Pursuing the Vision, Washington, DC. The World Bank.

Wudu Melese &Getahun Fenta (2009). Trend and Causes of Female Students dropout from teacher education institutions of Ethiopia: The case of Jimma University.

Yalew E (2003). Causes of students' attrition in Bahir Dar University: Qualitative and quantitative analyses. The Ethiopian Journal of Education 23(1):31-66.

Yeshimebrat M, Bishaw A, Asrat D, Nigussie Y (2009). The Study of Policy Intervention on Factors Affecting Female Students' Academic Achievements and Causes of Attrition in Higher Learning Institutions of Ethiopia.

Yorke M (2000). The Quality of the Student Experience: What can Institutions Learn from Data Relating to Non-Completion, Quality in Higher Education 6(1):61-75.

Zaheer Z, Imran SG, Saima WW (2016). Determinants of Student Dropouts: A Case Study of Business Students. Business & Economic Review 8:37-52. DOI: dx.doi.org/10.22547/BER/8.SE.3

Zoran M (2016). The link between students' satisfaction with faculty, overall students' satisfaction with student life and student performance. University of Split, Faculty of Economics, Review of Innovation and Competitiveness: A Journal of Economic and Social Research 2(1):37-60.