The Effects of Engagement on Learning Outcome among Undergraduate Sports Science Students in Ethiopia

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ABSTRACT

Despite increased attention paid to student engagement and their learning outcomes in universities in recent years, very little is known about the extent of engagement of undergraduate sports science students and how that is related to their learning outcomes in a university. This study examined the extent of student engagement and student learning outcomes, and further explored the extent of their relationships. A cross-sectional survey design was used. The sample includes volunteered undergraduate sports science students (n = 83)enrolled in four randomly selected public universities in Ethiopia. Quantitative data from the 83 respondents were analyzed using descriptive, bivariate correlations and a 2-steps multiple regression analysis. Findings reveal above average levels of engagement and learning outcome scores, and low to moderate relations between the scores. Both independently and interdependently, the student engagement factors reveal statistically significant relationships with all the measured outcomes, adjusted r2 ranging between 17 and 50% (p < .001). All significant predictors fall within regression coefficients (β) of 22 and 44% (p <.01 and .05 levels). Regression results suggest evidence of differential effects of student engagement on the measured learning outcomes. Implications for practice and suggestions for future research are also considered.

1. INTRODUCTION

1.1 BACKGROUND

Research shows that student engagement has an important effect on students' academic experiences and overall outcome of university education (Coates & Mahat, 2014; Pascarella, Seifert, & Blaich, 2010). Moreover, three decades of evidence suggests that student engagement, that is, students dedicating their time and energy to learning purposeful activities, is a significant predictor of their satisfaction and attainment of multiple learning outcomes of university (Ko, 2011; Pascarella & Terenzini, 1991, 2005; Wefald & Downey, 2009).

In recent years, student engagement has become the most influential factor that determines the learning and personal development of students both in-school and out-of-school contexts

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(Appleton, Christenson, & Furlong, 2008; Shernoff, 2013). For more than two decades, engagement has grown to a construct comprised of cognitive, emotional, and behavioural components (Christenson, Reschly, & Wylie, 2012) that embody and further develop academic competence and motivation among students in higher education (HE) (Russell & Slater, 2011).

Student engagement may feature interactive class formats and collaborative learning episode or a residential component of learning (Zhao & Kuh, 2004). The notion of engagement is thought to be particularly well suited to helping students improve their critical thinking and communication abilities (Gayles & Hu, 2009). Many studies have provided evidence indicating that engagement has influenced a range of learning outcomes such as:better ‘‘learning experiences’’ (John & Michael, 2007; Zhao &Kuh, 2004), ‘‘greater learning than disengaged participants (Rettig, 2013), took more responsibility for their own learning (Sluder, Buchanan, & Sinelnikov, 2009), earned higher grades, and demonstrated greater persistence (Appleton et al., 2008).

2. STATEMENT OF THE PROBLEM

Although a substantial amount of attention has been given to student engagement in purposeful learning activities, little is known about the factors that facilitate or hinder students learning and development in the African HE context (Rettig, 2013, Tadesse, Manathunga, & Gillies, 2017). This gap is also apparent in the sports science program due to lack of evidence specifically reflecting on what the student does during the university years and research in this area is very much needed (Tadesse, Mengistu, & Gorfu, 2016). The purpose of this study was to assess the extent to which undergraduate sports science student engages in purposeful learning activities, and how it influences desired learning outcomes in Ethiopian HE context.

Most of the internal and public scrutiny in the learning of students in sports science education involves the physical preparation and technical adequacies of the students in different sporting events. Skill acquisition in Sport examines how we learn such skills and, in particular, considers the crucial role of practice and instruction in the skill acquisition process (Hodges & Williams, 2012). There is a need to better articulate what contributes to engagement in learning purposeful activities for sports science students who participate in undergraduate sports education and how that in turn relates to desirable learning outcomes for this student population (Tadesse, Mengistu, & Gorfu, 2016). This issue is particularly important as the public becomes increasingly skeptical about the quality of sports science education for undergraduate students and distrustful about the role of sports education in Ethiopian higher education. To that end, the purpose of this study was to examine those factors related to student engagement in educationally purposeful activities at undergraduate sports science programs in

Ethiopian universities and its impact on a set of cognitive and affective outcomes. The following research questions guided this study:

1) To what extent do student background characteristics and other factors influence sports science students' engagement in educationally purposeful activities?
2) Controlling for student background characteristics and other factors, to what extent does engagement in educationally purposeful activities influence cognitive and affective outcomes for sports science students?

3. OBJECTIVES

3.1 GENERAL OBJECTIVE

To examine the magnitude of student engagement among the students of undergraduate sports sciences and how these predict student learning outcomes.

3.2 SPECIFIC OBJECTIVES

- To explore the level of engagement among sports science students in Ethiopian HE context.
- To determine whether sports science student engagement predicts higher levels of learning outcomes in Ethiopian HE context.

4. Student engagement and learning outcomes in higher education

The extent of student engagement was measured based on the four factors of student engagement and the resulted impacts was measured on desired learning outcomes consisting of general education, personal development, higher-order thinking, and satisfaction.

Conceptual Framework

The 2-steps hierarchical multiple regressions, include

1. Three controlling variables, involving gender, age, and grade year.
2. The 3-factor student engagement as predictors of desired learning outcomes explained in terms of student gains in general education Student gains in personal and social development, gains in higher-order thinking, and
3. Overall satisfaction.

Hypothesis

- H1: Sport Science student characteristics will tend to have moderate influence on desired student outcome than student engagement factors. That is, who the students are matters very little compared with what the students do in university.
- H2: Student engagement has significant positive impacts on a set of learning outcomes for sports science students, suggesting that students can benefit from increased engagement in purposeful learning activities during the university years.

- H3: Sports science student engagement in leads to improved learning outcomes: specifically, gains in general education, personal and social development, gains in higher-order thinking, and overall satisfaction with university experience.

5. METHODS

5.1 STUDY DESIGN

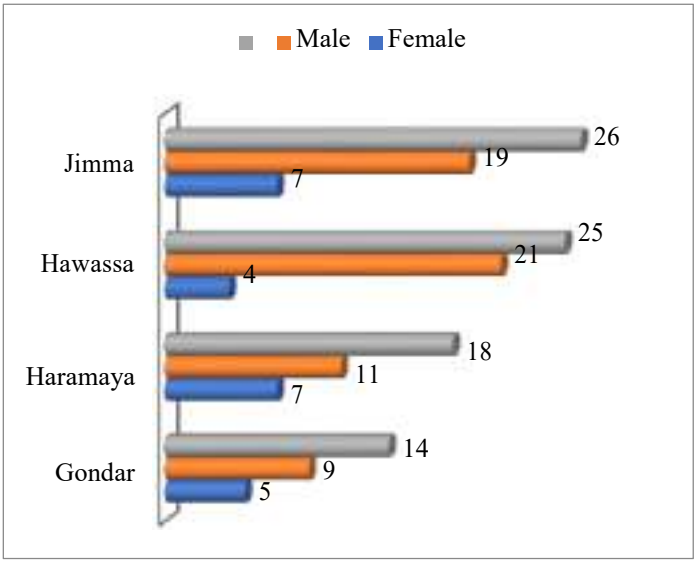
In this study, we used a cross-sectional survey design collecting data from sports science students.

5.2 STUDY PARTICIPANTS

Study participants weresamples (n = 83) of sports science students in four selected Ethiopian Public Universities (Gondar University, Haramaya University, Hawassa University, and Jimma University).

These universities were randomly selected from the nine first generation universities who have relatively long-years of experience in running undergraduate education within the country, including sports science education.

Figure 1 presents the number of study participants involved from each university sampled.



As shown in Figure 1, almost fairly equivalent participants were selected from Jimma University and Hawassa University. However, the student participants drawn from Harmaya University and Gonder University were relatively small. In terms of demographic characteristics, the study participants include undergraduate sports science students (n = 83), of which; ^{n}male = 60 and ^{n}female = 23 with a $Mean_{age}$= 21.02 and SD = 1.19. The gender composition of the study participants indicates Female 23 (28%) and Male 60 (72%). Also, the class year distribution shows that second year 50 (60%) and third year 33 (40%).

Measures

A modified Questionnaire containing 16 items of student engagement, 13 items of learning gains, and a single item measuring student satisfaction. These items are part of the results of an extensive

validation work as evidenced in the CFA (SEM) study at a large university in Ethiopia(Tadesse & Gillies, 2017; Tadesse, Manathunga, & Gillies, 2018).

5.3 DATA ANALYSIS

5.4 ETHICAL CONCERNS

This research was approved by the research ethics committee of Jimma University. All participants completed consent forms, which were stored securely. The research was explained to the study participants before the collection of the data. All data was anonymised using codes and pseudonyms and stored securely.

6. RESULTS

Descriptive statistics such as mean and standard deviations were calculated for the total samples. Table 1 presents the results of descriptive statistics.

Table 1. Descriptive Statistics for the engagement and educational outcome variables.

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Cronbach Alpha (α)
Geduc	82	1.00	4.00	3.15	0.76	.80
Psde	82	1.50	4.00	3.26	0.59	.82
Hot	82	1.50	4.00	2.97	0.63	.73
Satisfaction	81	1	5	3.55	0.94	.70
Active and colaborative learning	82	1.75	4.00	2.86	0.52	.71
S-t interaction	82	1.50	4.00	2.58	0.71	.66
Academic challenge	82	1.25	4.00	3.02	0.67	.80
Assessment challenge	82	1	4	2.84	0.78	.78

N.B. Satisfaction was measured with 2 items of a five-point Likert type scale consisting of 2 items.

As shown in Table 1, most of the mean scores fall above 3-point scores, except the two measures of active and collaborative learning and student-teacher interaction scores. Of the scores presented in Table 1, the sample participants have the highest score in their entire experience score while they have the least score in student-teacher interaction. Overall, the results show that all the scores are well above average.

Bivariate correlation

Table 2 presents bivariate correlations between student engagement scales and self-reported learning outcome measures. Active and collaborative learning, student-teacher interaction, and academic challenge were correlated with personal and social development scores at .49, .48, and .58, respectively.

Table 2. Summary of the Correlation Matrix for the engagement and learning outcome variablles

Engagement Variables	Educational Outcome Variables			
	Geduc	Psde	Hot	Satis
Active and Collaborative learning	.37**	.53**	.37**	.22
S-t interaction	.36**	.46**	.48**	.42**
Academic challenge	.37**	.58**	.49**	.22
Assessment challenge	.19	.31**	.30**	.05

** Correlation is significant at the 0.01 level (2-tailed).

Table 2 presents bivariate correlations between student engagement scales and self-reported learning outcome measures.

As shown in Table 2, we found a number of moderate, statistically significant positive correlations between the scores of student engagement and self-reported learning outcome measures.

Level of active and collaborative learning, student-teacher interaction, and academic challenge tasks yielded positive correlations with general education gains, personal and social development gains, higher order thinking gains, and satisfaction of .22 or greater. None of the 12 correlations with self-reported learning outcome scores was negative.

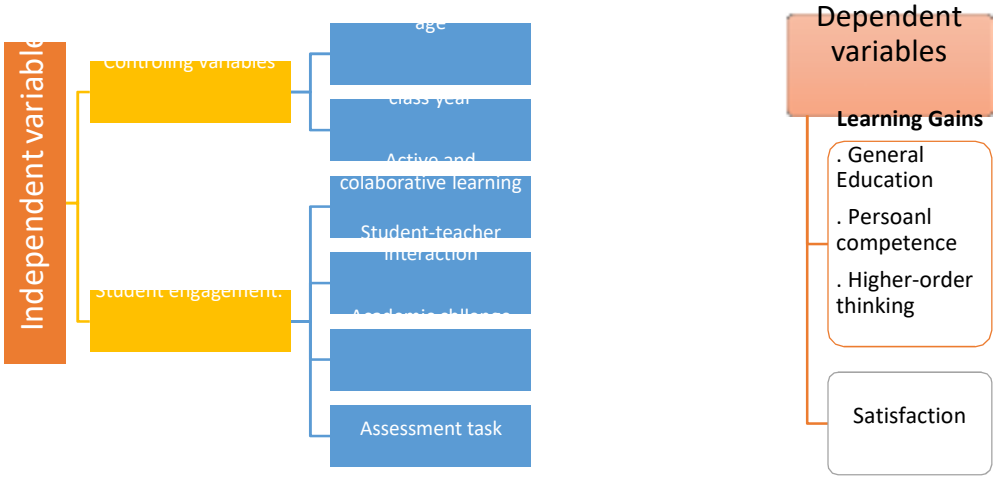
Active and collaborative learning and academic challenge scores had somewhat lower correlations with self-reported satisfaction scores than did student-teacher interaction scores.

Active and collaborative learning, student-teacher interaction, and academic challenge were correlated with personal and social development scores at .53, .46, .58, and .31, respectively.

6.1 REGRESSION MODELS

Two-step hierarchical regressions were used, including two controlling variables, along with the 4-factor student engagement scale as predictors.

Figure 3 illustrates the regression models predicting general education, personal and social development, higher-order thinking, and satisfaction.



The two-step hierarchical regressions were employed to evaluate the effects of controlling variables and student engagement variables in predicting students' self-reported gains and satisfaction. The first step consisted of controlling variables: age and class year to predict students' self-reported learning outcomes as measured by predictions of general education gains, personal development gains, higher-ordered thinking gains, and satisfaction. In the second step, the 4-factor student engagement variables were added to the controlling variables for predictions of the self-reported gains and satisfaction outcomes across the four regression equations. The second step helped to reveal the proportion of variations in general education, personal development, higher-order thinking, and satisfaction outcomes, explained by student engagement, over and above that explained by controlling variables.

In the first step, the controlling variables: age and class year statistically predicted students' gains in general education and personal development, respectively when entered first into the regression models (Step 1: Model1 R^2 = 0.12, F[2, 79] = 5.43, p = .006; and Model2 R^2 = 0.16, F[2, 79] = 7.44, p = .001), however, the other two models did not show significant predictions. When the student engagement variables were added to the regression models, they brought significant changes in predictions across the 4 models. Step 2: Model1 R^2 = .32, ΔR^2 .20, F Change [6, 73] = 5.84, p < .001, Model2 R^2 = .58, ΔR^2 = .42, F Change [6, 73] = 16.70, p < .001, Model3 R^2 = .40, ΔR^2 = .40, F Change [6, 73] = 8.26, p < .001, and Model4 R^2 = .23, ΔR^2 = .23, F Change [6, 73] = 3.65, p = .003. It is clear from these results that the inclusion of the student engagement variables resulted in substantial changes in capacity to predict the four measured outcomes, with the relatively highest prediction on personal development gains than other learning outcomes measured. Table 6 presents summary of hierarchical regression analysis for variables predicting general education, personal development, higher-order thinking, and

satisfaction.

Table 4. Two-Steps Hierarchical Multiple Regression Models Predicting Personal and Social Development Outcomes (n = 83).

	Unstandardized Coefficients			Standardized Coefficients	95% Confidence Interval	
Predictors	B	SE	t	Beta	Lower Bound	Upper Bound
Age	-.10	.04	-2.34	-.20*	-.18	-.01
Class year	-.18	.11	-1.68	-.15	-.39	.03
Active & collaborative learning	.23	.11	2.16	.20*	.02	.44
Student teacher interaction	.21	.07	2.81	.25*	.06	.36
Academic Challenge	.26	.08	3.04	.30**	.09	.43
Assessment challenge	.15	.06	2.43	.19*	.03	.27
Adjusted R^2	.50					
F	16.70***					

Note: 1Standard Error

*Significance levels. * p < .05, ** p < .01, *** p < .001*

Table 5. Two-Steps Hierarchical Multiple Regression Models Predicting Higher-ordered Thinking Outcomes (n = 83).

	Unstandardized Coefficients			Standardized Coefficients	95% Confidence Interval	
Predictors	B	SE	t	Beta	Lower Bound	Upper Bound
Age	.00	.05	.04	.00	-.10	.11
Class year	-.01	.14	-.10	-.01	-.28	.26
Active & collaborative learning	.04	.13	.30	.03	-.23	.31
Student teacher interaction	.27	.09	2.89	.31**	.09	.46
Academic challenge	.31	.11	2.88	.33**	.10	.52
Assessment challenge	.18	.08	2.40	.23*	.03	.34
Adjusted R^2	.36					
F	8.26***					

Note: 1Standard Error

*Significance levels. * p < .05, ** p < .01, *** p < .001*

Table 6. Two-Steps Hierarchical Multiple Regression Models Predicting Student Satisfaction (n = 83).

	Unstandardized Coefficients			Standardized Coefficients	95% Confidence Interval	
Predictors	B	SE	t	Beta	Lower Bound	Upper Bound
Age	-.11	.09	-1.21	-.14	-.28	.07
Class year	-.30	.23	-1.31	-.16	-.76	.16
Active & collaborative learning	.05	.22	.22	.03	-.40	.50
Student teacher interaction	.60	.16	3.73	.46***	.28	.92
Academic challenge	-.09	.18	-.49	-.06	-.45	.27
Assessment challenge	-.04	.13	-.35	-.04	-.30	.21
Adjusted R^2	.17					
F	3.65**					

Note: 1Standard Error

*Significance levels. * $p < .05$, ** $p < .01$, *** $p < .001$*

It is clear from Table 3-6 that in step 2, the student engagement variables, rather than, the control variables contributed to the predictions of the measured outcomes. In model 1, the student-teacher interaction ($\beta = .27, t\,[73] = 2.36, p = .021$) and age ($\beta = .29, t\,[73] = 2.63, p = .011$) contributed to the model. Similarly, in the second model, the active and collaborative learning ($\beta = .20, t\,[73] = 2.16, p = .034$), the student-teacher interaction ($\beta = .25, t\,[73] = 2.81, p = .006$), academic challenge ($\beta = .30, t\,[73] = 3.04, p = .003$), and the assessment task ($\beta = .19, t\,[73] = 2.43, p = .018$) contributed to the model. Moreover, in the third model, the student-teacher interaction ($\beta = .31, t\,[73] = 2.88, p = .005$), academic challenge ($\beta = .33, t\,[73] = 2.89, p = .005$), and the assessment task ($\beta = .23, t\,[73] = 2.41, p = .019$) contributed to the model. Also, in the final regression model, only the student-teacher interaction ($\beta = .46, t\,[73] = 3.73, p < .001$) contributed to the model. In the second step, age contributed for predictions of general education and personal development while class year did not predict any of the learning outcomes measured. The results of multivariate analyses show that the variation in students self-reported gains and satisfaction can be attributed to the four student engagement variables, over and above the controlling variables where $R^2 \geq .23$.

In summary, the results suggest that higher frequencies of student engagement experiences tend to also have higher levels of self-reported gains in general education, personal and social development, and higher-order thinking, and overall satisfaction. It also suggests that the student active and collaborative learning experience has a minimal observable effect on the student self-reported gains attributed to greater experience of the active and collaborative learning experience. It was also found that the

relationship between age and student gains in general education and personal and social development outcomes may be spurious as well as the relationships between class year and student gains in higher order thinking. These apparent relationships disappear when the student engagement sub-scales are taken into account.

7. DISCUSSION

This study aims to determine the relationships between key student engagement behaviors and the resulted learning outcomes among a sample of sports sciences students. To do so, student-level records from four public universities are merged to examine the links between student engagement and four key learning outcomes: general education gains, personal development gains, higher-order thinking gains, and satisfaction with the university experience.Results demonstrated strong significant effects of undergraduate sports science students' engagement experiences on the learning gains measures, and moderate but still significant total effects on student satisfaction.

Finding positive relationships between the undergraduate sports science student engagement factors and the self-reported gains and satisfaction highlights the positive relationship between perception of engagement experience in university and perceived attainment of gains and satisfaction (Coates, 2006; Kuh, 2008). The results found in the current study is consistent with the literature in this field confirming the moderate effects of demographic variables on the learning gains and the significant greater effects of student engagement variables after adjusting for the demographic variable and university experience (Khan, Butt, & Baba, 2013; Luu & Freeman, 2011; Porchea, Allen, Robbins, & Phelps, 2010).

Further, the positive associations found between the student engagement sub-components and the self-reported gains and satisfaction, in the current study, confirms the presence of positive relationship. However, this initial validation shows only the evidence in selected variables; further study is needed to identify the variables more widely, including more institutions to support generalizations in a broader sense.

Research provides empirical support for the assumptions that students increased engagement were significant and related to students' reports of developing other essential skills and competencies (Luu & Freeman, 2011; Safar & AlKhezzi, 2013) . Moreover, different types of engagement have been found to be differentially related to learning outcomes (Gonyea & Miller, 2011; Luu & Freeman, 2011). The results of this study support earlier research in that positive relationship and differential effects of the student engagement experience have proven support. It is clear from Table 8 that students' x, y, z, and assessment task were positively related to student learning outcomes, but with varying explanatory power ranging between, β = .20 to .46. Conversely, the students experience in the active and collaborative learning was related only to

personal development gains than the other outcomes measured, suggesting that undergraduate sports science student' active and collaborative learning experiences in undergraduate courses had limited effect on the students' progress in personal development gains.

Although students age and class year from controlling variables increased somewhat the percentage of variance explained by the student engagement variables, its explanatory power was still minimal compared to that of the integrated ICT variables almost in all learning outcomes measured. Effect size analysis revealed a substantial change in the outcome variables by the student engagement variables, except for the variable "x". There are several credible explanations for why the assessment tasks did not show significant predictions for some of the four outcome measures. The first possibility is that the assessment task may be replicated from-year-to-year so that students may depend on earlier assignment reports for completion rather than investing time and energy to complete writing assignments, or may be students complete most of the writing tasks in groups so that a more able student(s) may take charge of completing the task so that individual efforts are masked.

The notion of student engagement could have significant implications for the field of sports science in higher education that is still largely unexplored. The analyses suggest that different engagement experiences are not equivalent, and that measuring one without the other may ignore significant interactions between them, potentially distorting the results. Furthermore, other constructs (e.g., self-reported gains) tend to relate differently to each dimension, such that important relationships might be overlooked if student engagement factors are not considered simultaneously. This has implications for theory as well as measurement because it means that student engagement is a multidimensional construct. In summary, while we support the call for greater focus on student engagement for the sports science students, such conceptual modelling can only be properly undertaken when an appropriate measurement strategy has been developed, including the four-dimensional measures identified in this study.

As shown in Table x, the overall effects of student engagement on self-reported outcomes were between strong and moderate relationships. Results demonstrated strong significant effects of such engagement experiences on the learning outcomes for students of sports sciences, and moderate but still significant total effects on student satisfaction.

7.1 STUDY LIMITATIONS AND FUTURE DIRECTIONS

The current study relied exclusively on self-report measures for its data. Also, the inclusion of small samples of sports science students enrolled in the first-generation public universities in the current study also limits the generalizability of the findings.

8. CONCLUSIONS

The results from this study point to several conclusions. First, findings reveal above average levels of engagement and learning outcome scores, and low to moderate relations between the scores of student engagement and desired learning outcomes. Student-teacher interaction was found to have the largest influence on the measured learning outcomes. Second, like other university students, student background characteristics tend to have limited influence on engagement in purposeful educational activities. That is, who the undergraduate sports science students are matters very little in what these students do in university. Second, engagement has positive and significant impacts on a set of university outcomes for sports science students, suggesting that sports science students can benefit from increased engagement in purposeful educational activities in ways similar to the general student population. Finally, the findings show evidence that the influence of student engagement on learning outcomes is not conditional on the type of demographic characteristics of the student participants enrolled in, suggesting differential effects for sports science students.

9. IMPLICATIONS

9.1 THEORETICAL AND PRACTICAL IMPLICATIONS

Evidence of relations between students' engagement and student learning outcomes may prove support to establish a pattern of relationship between them within the prevailing contextual realities of students enrolled in undergraduate sports science programs in Ethiopia. Also, the research illuminates some exemplars of good practice in sport science education that are aligned to the model.

9.2 Implications for Future Research

Future research should employ larger and more randomized samples across different generation of universities to help improve the generalizability as well as decrease bias in the design. The incorporation of considerable numbers of teachers into future research designs would also add to the overall scope of the findings and allow for further comparative analysis between students and teachers perceptions. It may also be valuable in future research designs to obtain more demographic information regarding socioeconomic status, parental occupation, financial resources, language spoken at home, and social support networks. Longitudinal research designs would also help to better assess the changes in students' level of engagement and learning outcomes attained over time.

10. REFERENCES

Appleton, J. J., Christenson, S. L., & Furlong, M. J. (2008). Student engagement with school: Critical conceptual and methodological issues of the construct. *Psychology in the Schools, 45*(5), 369-386. doi:10.1002/pits.20303

Christenson, S., Reschly, A., & Wylie, C. (2012). *Handbook of research on student engagement*. New York: Springer.

Coates, H. (2006). *Student engagement in campus-based and online education: university connections*. New York: Routledge.

Coates, H., & Mahat, M. (2014). Assessing student engagement and outcomes: Modelling insights from Australia and around the world. *International Journal of Chinese Education, 2*(2), 241-264.

Gonyea, R., & Miller, A. (2011). Clearing the AIR about the use of self-reported gains in institutional research. *New Directions for Institutional Research, 2011*(150), 99-111. doi:10.1002/ir.392

Hodges, N. J., & Williams, A. M. (2012). *Skill acquisition in sport: research, theory and practice*. Abingdon, Oxon: Routledge.

Khan, S. M., Butt, M. A., & Baba, M. Z. (2013). ICT: Impacting Teaching and Learning. *International Journal of Computer Applications, 61*(8), 7-10. doi:10.5120/9946-4589

Ko, M. S. (2011). *College Student Satisfaction: Examining Influences and Differences in a Public University System.* (Dissertation/Thesis).

Kuh, G. (2008). Why Integration and Engagement are Essential to Effective Educational Practice in the Twenty-first Century. *Peer Review, 10*(4), 27-28.

Luu, K., & Freeman, J. G. (2011). An analysis of the relationship between information and communication technology (ICT) and scientific literacy in Canada and Australia. *Computers & Education, 56*(4), 1072-1082. doi:10.1016/j.compedu.2010.11.008

Pascarella, E., Seifert, T. A., & Blaich, C. (2010). How Effective Are the NSSE Benchmarks in Predicting Important Educational Outcomes? *Change: The Magazine of Higher Learning, 42*(1), 16-22. doi:10.1080/00091380903449060

Pascarella, E., & Terenzini, P. (1991). *How College Affects Students*. San Francisco: Jossey-Bass.

Pascarella, E., & Terenzini, P. (2005). *How College Affects Students: A Third Decade Of Research*. Jossey-Bass: Higher & Adult Education.

Porchea, S. F., Allen, J., Robbins, S., & Phelps, R. P. (2010). Predictors of Long-Term Enrollment and Degree Outcomes for Community College Students: Integrating Academic, Psychosocial, Socio-demographic, and Situational Factors. *The Journal of Higher Education, 81*(6), 680-708.

Russell, B., & Slater, G. R. L. (2011). Factors that Encourage Student Engagement: Insights from a Case Study of "First Time" Students in a New Zealand University. *Journal of University Teaching and Learning Practice, 8*(1).

Safar, A. H., & AlKhezzi, F. A. (2013). Beyond computer literacy: technology integration and curriculum transformation. *College Student Journal, 47*(4), 614-626.

Shernoff, D. J. (2013). *Optimal learning environments to promote student engagement*. New York, NY: Springer.

T**adesse, T., & Gillies, R. (2017)**. Testing robustness, model fit and measurement invariance of a student engagement scale in African University context. *Australian Journal of Career Development, 26*(3), 92-102. doi:10.1177/1038416217724172

Tadesse, T., Manathunga, C. E., & Gillies, R. M. (2018). The development and validation of the student engagement scale in an Ethiopian university context. *Higher Education Research & Development, 37*(1), 188-205. doi:10.1080/07294360.2017.1342605

Tadesse, T., Mengistu, S., & Gorfu, Y. (2016). Using research-based evaluation to inform changes in the development of undergraduate sports science education in Ethiopia. *Journal of Hospitality, Leisure, Sport & Tourism Education, 18*, 42-50. doi:10.1016/j.jhlste.2016.02.002

Wefald, A. J., & Downey, R. G. (2009). Construct dimensionality of engagement and its relation with satisfaction. *The Journal of psychology, 143*(1), 91-112. doi:10.3200/jrlp.143.1.91-112

Cited as: ***Tefera T. (PhD), (2021):*** *The Effects of Engagement on Learning Outcome among Undergraduate Sports Science Students in Ethiopia. Ethiopian Journal of Sport Science (EJSS),*