

Croatian Journal of Education
Vol.20; No.3/2018, pages: 903-937
Preliminary communication
Paper submitted: 9th November 2017
Paper accepted: 26th February 2018
<https://doi.org/10.15516/cje.v20i3.2979>

The Relation between College Resources and Learning Outcomes: Considering the Mediating Effects of Student Engagement

Joseph Malechwani and Lei Hongde
Huazhong University of Science and Technology, School of Education

Abstract

The purpose of this study was to examine the relation between college resources and learning outcomes through the mediation of student engagement. Based on data collected from 430 college students and 122 faculties spread across the Coastal Region of Kenya, we used the structural equation model approach to test a model that hypothesised the relation between college resources and learning outcomes. Using student engagement as a parameter, statistical analyses demonstrated that college resources have a significant and indirect effect on student learning outcomes. The regression coefficient of college resources on student learning outcomes is reduced from 0.62 to 0.01 and is insignificant when student engagement is added to the model. The results reveal that the effects of college resources should be evaluated in terms of the degree to which they increase student engagement. Implications for practice and further research directions are also discussed.

Key words: *achievement; environment; involvement; vocational colleges.*

Introduction

Background of the Study

In virtually all African countries, the demand for access to higher education is growing rapidly and straining available resources. The ever-increasing student body has created a bundle of challenges mostly associated with quality. Recently, increasing emphasis is being placed on establishing balance between quantity and quality in the sense that increasing enrolment without setting assurance standards will render higher education

ineffective. Enhancing quality training has helped generate opportunities and benefits for personal, social, and economic development (Kimani, Kara, & Njagi, 2013). The situation at hand has made many governments and the public put pressure on colleges to enhance quality training. In order to move forward and reach a higher level of quality in higher education, it is important to underscore the needs of the learner and the nature of learning outcomes. In Kenya, for example, offering quality training in colleges has been captured in the development blueprint by which the country aspires to become an industrialised nation by the year 2030. In a press statement, the Cabinet Secretary of Education in Kenya asked colleges to put in place structures that will ensure that students will get quality and relevant education (Omulo, 2017). Even with such a thrust for academic standards, many colleges, especially in the Coastal Region of Kenya, have been performing poorly in the national examination (KNEC, 2016). Reports have indicated that once students enrol in colleges they start showing a lack of interest and become disengaged, which leads to poor performance. Since the time spent on learning accounts for a large portion of student life, education leaders should adjust the college set-up to incorporate enjoyable learning experiences that will bring about desirable outcomes. In their pursuit of high-quality learning, researchers have argued that institutions with inadequate resources often exert much pressure on existing resources, making lecturers compromise their methodology as an adaptive mechanism which, consequently leads to poor performance (Onyara, 2013). Resources such as quality of faculties, learner attributes, learning environment, facilities, and the organization of the curriculum also plays a major role in promoting quality education. However, the interaction effect that exists between these resources and academic performance requires a conducive environment in place. Generally speaking, learning improves when students are engaged and suffers when they are disengaged. Recently, researchers have used the term student engagement to refer to the extent to which students identify with and value schooling outcomes by taking part in both academic and non-academic activities (Willms, 2003). This article explores two theories in education: resources and engagement, and how they are related to learning outcomes of college students. In brief, our article suggests that students should engage with college resources to promote academic success. College resources provide learners with an environment that will determine the build-up to instructional content, while student engagement plays a major role in the teaching and learning process. The two aspects play a critical role in academic achievement. This study therefore seeks to find out whether college resources and student engagement are linked with college student learning outcomes in the Coastal Region of Kenya. Empirical findings of the study provide valuable insights for stakeholders' understanding of the interrelationships among the variables in play for effective college students' experiences.

Rationale for the Study

While numerous studies have focused on the one-dimensional effect of variables influencing student learning outcomes – namely, institutional resources (Musau, & Migosi, 2014) and family background (Chang, 2014) – studies that investigate the linkage

that exists between college resources, student engagement, and learning outcomes of college students are scarce. In addition, most of these studies are based on elementary education and as such are minimally specific to college education. The structural relationship between the predictor variables that affect learning outcomes is largely neglected in these studies, with some exceptions such as Kim (2015), who studied the relation between discussion activities and interactions with faculty on learning outcomes of college students through the mediating effects of self-directed learning capability. To respond to these issues, it is necessary to establish a relationship between college resources, student engagement, and student outcomes using data and valid measurements. This requires colleges to avoid prejudice about the effectiveness of their policies and practices in the absence of information about the quality of student experience. This study fills these gaps by analysing the relationship and effects (direct or indirect) of the variables of college resources and student engagement on the learning outcomes of students. Therefore, the objective of this study was to analyse the relationships that exist among college resources, student engagement, and students' learning outcomes. Our hypotheses are: 1) college resources affect student learning outcomes directly in the absence of engagement; and 2) college resources affect student learning outcomes indirectly through engagement. The study gives rise to further hypotheses, thereby increasing the possibility of adding to existing knowledge and raising the quality of higher education.

Review of Literature

Student Learning Outcomes

Student learning outcomes have traditionally been defined in terms of the particular levels of knowledge, skills, and capabilities acquired after students have engaged in a certain set of teaching and learning experiences (Ewell, 2006). Presumably, anything that happens to a student as a result of attending a college or taking part in a particular course of study can be termed a learning outcome. A number of studies on student learning outcomes use standardized achievement test scores such as a grade point average as a measure of academic achievement (Hanushek, 2016); some, however, employ other measures such as student attributes (Astin, 1999), drop-out rates (Tinto, 1987), knowledge, and skills (Ewell, 2006). Learning outcomes in institutions of higher learning have been reported to be the subject of various input variables. However, conflicting results show no consensus on the specific variables that influence learning outcomes (Rivkin, Hanushek, & Kain, 2005). Researchers have identified that variables change what learners can achieve. Such variables consider the best ways for students to learn through appropriate planning of materials and activities.

College Resources

Many college administrators have placed resource acquisition at the top of their priority lists. In a college context, the term resource revolves around a range of factors seen as promoting students' learning: human resources, fiscal resources, and physical

resources. The theory of resource ascertains that if sufficient resources are mobilised in one place, positive student learning outcomes will follow.

Physical Resources

Physical resources are important in determining students' performance (Abbasi & Mir, 2012). Classrooms, laboratories, libraries, playing fields, and textbooks are just a few physical resources which, according to Gu (2003), promote effective teaching and learning processes, and thus students' educational growth. Provision of state-of-the-art equipment in learning institutions boosts the quality and relevance of imparted learners' skills. This is because learning involves interaction between students and their environment. The availability of adequate physical resources was found to have a significant contribution on students' academic achievement (Adeyemi & Adeyemi, 2014).

Human Resources

Human resources, in particular, faculty-student ratio, administrative policies, and the quality of lecturers and students, determine the quality of academic achievement. Well-trained faculty members have pedagogical skills that promote student understanding, and low faculty-student ratio upholds greater learning and personal development. The two aspects establish a trade-off between the quality (well-trained staff) and quantity (low faculty-student ratio) perspective of resource theory. Studies on students' background characteristics and academic achievement reveal that entry marks (Marzano, 2004) and socio-economic status (Chang, 2014), among others, pose a serious challenge on students' learning outcomes.

Fiscal Resources

Fiscal resources – specifically financial aid – have recently shown conflicting results in relation to students' achievement (Hossler, Ziskin, Kim, Cekic, & Gross, 2008). Singell and Stater (2012) found that financial aid had no independent effect on academic achievement, but that merit aid attracted students with characteristics associated with a higher likelihood of academic excellence. In contrast, grants had a strong positive effect on academic achievement (Cofer & Somers, 2000). An assessment of the distinct effects of merit- and need-based aid exposed primarily positive relationships between the form of aid and academic success (DesJardins, Ahlburg, & McCall, 2002).

Student Engagement

The Australian Council of Educational Research defines student engagement as student participation in activities and settings likely to generate high-quality learning (Zepke & Leach, 2010). The theory of student engagement establishes processes and interactions which occur within schools which can promote the academic achievement of all students, with learners benefiting from close engagement with peers, the faculty's active learning approaches, and the social set-up. This article synthesises literature from a variety of research perspectives and develops a conceptual framework organized around

three perspectives on engagement. Each perspective provides suggestions that together offer a blend of student engagement, as well as valuable intuition of what promotes student success and why.

Peer Engagement

Student orientation programmes and residence halls both play a vital role in student bonding outside the classroom. Orientation processes in particular help students settle into academic life by connecting them socially with peers, mentors, and staff in order to familiarise them with the campus and provide clarification on academic study expectations (Pittaway & Moss, 2006). Most important to note here is the perceived positive association between academic achievement in a peer group and academic achievement of an individual student within that group (Altermatt & Pomerantz, 2005). This implies that students surrounded by highly dense networks of high-achieving peers perform better than those surrounded by low-achieving peers (Maroulis & Gomez, 2008). Furthermore, emotional support and friendship also promote academic success whereas rejection by peers has a negative effect on academic success.

Faculty Engagement

In their extensive literature review, Carini, Kuh, Klein, and Kleint (2014) place teaching and teachers at the heart of engagement. Faculties serve as the interface for the transmission of knowledge, values, and skills during the learning process. Students are more likely to be engaged if they are supported by faculty members who create friendly learning environments, demand high standards, and make themselves freely available to discuss academic progress (Bryson & Hand, 2007). Reason, Terenzini, Domingo, and Domingo (2010) determined a more significant improvement in academic performance among first-year students who felt supported academically by their lecturers than among students who did not feel the same kind of support. Faculties should therefore challenge students by creating rich educational experiences that will stretch their ideas as far as they will go.

Social-Cultural Engagement

Students, especially those from minority groups, should be assisted in building on the socio-cultural capital necessary for engagement and success within and beyond the classroom. This socio-cultural capital is developed through a sense of belonging, active engagement with others, and knowing how things work (Krause, 2005). The culture of the institution is vital to student engagement and must therefore support the learning process (Porter, 2006). Institutions need to change and create a culture that is more welcoming to the increasing diversities of the student body (Johnson, Soldner, Leonard, Alvarez, Inkelas, Rowan-Kenyon, & Longerbeam, 2007). Lastly, colleges should expand extracurricular areas to include domains such as leadership, social life, clubs, and games which help bring together learning experiences and social interaction, thereby satisfying students' college experience. Participation in extracurricular activities is a useful vehicle for students to gain academic and social experiences (Broh, 2010).

Theoretical Framework

This study hinges on the education production function theory whereby input is processed into outputs (Hanushek, 2016). In this case, the economic concept of production function is applied in the field of education. Here, the education system is seen as a productive system that relates to how various input affecting students' learning outcomes can be enhanced. Desired output or academic standings can be achieved through appropriate teaching and learning processes. Consequently, students' success depends on how effectively faculties and students utilise teaching and learning input. Recent research increasingly moves beyond a strictly linear progression by providing alternatives to the traditional input-to-output model of education production function which is not mediated. This alternative model suggests that input may directly affect both processes and output. One such model is Astin's I-E-O model, which consists of Input, Environment, and Output (Astin & Antonio, 2012).

Modelling the Predictors of Learning Outcomes for College Students

This article uses concrete literature by well-established scholars to design a new comprehensive college impact model. The model comprises three distinctive components: college resources, student engagement, and students' learning outcomes. The relationship among the three components of the conceptual model is shown schematically in Figure 1. The principal concern of this research is to assess the following relationships: (A) effect of resources on engagement; (B) effect of engagement on learning outcomes; and (C) effect of resources on learning outcomes. In addition, the investigators also examined the interaction effects involving resources and engagement on academic achievement (AB).

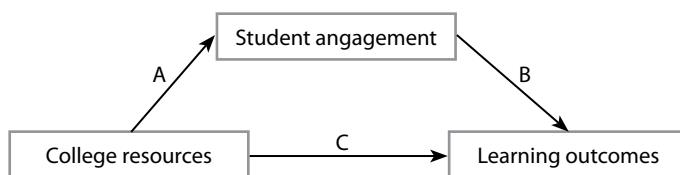


Figure 1. A new college impact model

Research Methodology

The purpose of the study which emerged within the above-mentioned framework is to investigate whether resources and engagement are linked with the learning outcomes of college students in the Coastal Region of Kenya. In this sense, the following research question formed the starting point of the present study: What are the opinions of faculty members and students about the resources and how college students engage with these resources to promote learning outcomes?

Design

The study adopts a quantitative and cross-sectional research approach. Since resources and engagement that influence student learning outcomes are inherent in colleges and can be observed and measured, the quantitative approach was found to be more effective for gathering data. The research also uses a cross-sectional approach because the fundamental variables under resources, engagement, and learning outcomes were involved at a single point in time.

Participants

At the time of data collection, the target population for this study was 9,550 students in the academic year 2016/2017 (excluding first-year students) and 570 faculty members from five vocational colleges in Kenya. Based on the size of the target population, a sample of 696 respondents was drawn, which was considered representative of the population, according to Slovin's Sampling Formula: $n = N / \{1 + N e^2\}$ (Wanjala & Malechwani, 2016). Out of the 696 questionnaires distributed, only 552 (response rate of 79%) were found complete and valid for analysis. This is far greater than 300, the required minimum for carrying out a study (Field, 2005). The majority of the participants were male (380; 68.8%). Slightly over one third of the participants were in engineering (199; 36%), with a slightly lesser number in applied science (121; 22%). Of the total number, 83 participants were students of/faculty members in departments of arts and humanities (15%), 77 participants were in business (14%) and 72 in social sciences (13%).

Procedures

Firstly, we sought permission to collect data from the National Commission for Science, Technology and Innovation of Kenya; then we contacted the administrators of the colleges included in the research sample to book appointments for research site visits. We then divided the sample size into five strata (five colleges); within each college, students' admission numbers and faculty employment numbers were obtained from relevant register books stored in the registrar's office. The Research Randomiser application was then used to generate random numbers of each set in a computer (Bellhouse & Kulperger, 1991). The numbers were then identified, and the respective students and faculty members noted; the survey instrument was then issued to students and faculty members to fill and submit voluntarily. Moreover, accompanying the survey was a brief letter requesting participation and describing the purpose of the survey. The letter also guaranteed respondents that their responses would be treated confidentially.

Research Instrumentation

Two sets of structured questionnaires – one for students and the other for faculty members – entitled *2017 College Life Survey*, were designed to guide the data collection. After considerable modification, operating items were extracted from *The National*

Survey of Students Engagement (NSSE). The NSSE instrument measures the extent to which students partake in educational practices that previous research shows are associated with valued college outcomes (Kuh, 2003). A total of 101 questions were obtained and organized into 5 subsets: resources (20 items), peer engagement (21 items), faculty engagement (17 items), socio-cultural engagement (26 items), demographic information (4 items), and learning outcomes (13 items). All the items used a four-point Likert scale as the optimum number of alternatives (Lee & Paek, 2014) to minimise the effects of the odd scale (Revilla, Saris, & Krosnick, 2013).

Reliability

The psychometric properties of the NSSE survey instrument are well established and balanced (Kuh, 2003). Furthermore, results from the NSSE report are reasonably stable year by year, a strong indicator of reliable measurements (Rugutt & Chemosit, 2005). In this study, learning outcomes were the dependent variables while resources and engagement were predictor variables that affect student learning outcomes. We estimated internal consistency using reliability analysis procedures of SPSS on a given set of construct variables (Field, 2005). The Cronbach's α values for the 4 constructs: resources (0.926), engagement with peers, faculty, and socio-culture (0.953, 0.965, and 0.984 respectively) were above the threshold value of 0.70 for consistent and reliable scale (Peterson, 1994).

Validity

The principle component method of exploratory factor analysis was used as a basic prerequisite for construct validity checking in the one-dimensionality of the measure. All variables with coefficients below 0.45 were eliminated and case wise diagnostics was used to remove outliers with a deviation of ± 2 . This reduced the number of parameters to be estimated from 101 to 73. The ratio of sample size to parameters was found to be 8:1; which lies between 20:1 and 5:1 for stable estimates (Kline, 2005). Varimax Rotation was applied which produced factor loadings of the variables ranging from 0.500 to 0.818. The total variance explained by the four factors extracted was 91.419% (resource: 29.437%, peer: 24.876%, faculty: 21.426%, and socio-cultural: 15.679%). Results of the Kaiser-Meyer Olkin test support sampling adequacy and suitability of data for unifactorial determination (0.978 at 0.000 significance level). Finally, all four constructs were significant and positively correlated with student learning outcomes, thus establishing criterion-related validity.

Data Analyses

The data collected were analysed using SPSS 21.0 and Amos 21.0. A variety of analyses were completed, including: descriptive statistics; exploratory Principal Components Analysis (PCAs) to identify empirically derived dimensions of the study factors; reliability analyses for each measurement dimension; Confirmatory Factor Analysis

(CFA) to operationalize the latent variables; goodness of fit; and Structural Equation Modelling (SEM). In particular, SEM was used as the primary method for analysing data, since it can establish direct and indirect effects of each variable included in the model on the outcome variable. The correlations and covariance matrices from SPSS were used by Amos to develop SEM that was generated via generalized least-square estimation (Kline, 2005). In this study, the education system was viewed as productive with inputs such as resources and engagement, while student learning outcomes were viewed as output. In this regard, the regression model was found to be the most suitable.

Basically, there are two types of education production functions: namely, value-added for longitudinal data and linear additive for single period data (Mostafa, 2010). Since data were collected only over a single period, a linear additive seemed more suitable for this dataset, as depicted in equation one. We then used the causal steps procedures approach to analyse mediation effects (Baron & Kenny, 1986). This approach involves three sets of regression equations relating independent, mediator, and dependent variables (see equations 2, 3, and 4). The results from these equations were used to evaluate the following conditions for the mediation effect: (1) resources should significantly relate to learning outcomes; (2) resources should significantly relate to engagement; (3) engagement should significantly relate to learning outcomes; (4) resources should indirectly relate to learning outcomes through engagement. Satisfying all conditions provides evidence for complete mediation; in contrast, the first three conditions indicate partial mediation.

$$y_i = f(R_i, E_i) + \varepsilon_{ij} \dots\dots\dots(1)$$

$$y_i = \beta_0 + \beta_1 R_i + \varepsilon_i \dots\dots\dots(2)$$

$$E_i = \beta_0 + \beta_1 R_i + \varepsilon_i \dots\dots\dots(3)$$

$$y_i = \beta_0 + \beta_1 E_i + \beta_2 R_i + \varepsilon_i \dots\dots\dots(4)$$

Results

Descriptive Statistics

All the construct variables had a total of 14 parameters to be estimated and their mean was far above 2.0, given the four-point Likert scale. Construct variables showed a small deviation from the mean, which is seen as an indication of homogeneous scores. Looking closer into variables within each construct, the following observations were made. For resource latent variable, item means for both faculty members and students ranged from a high of 3.10 and 3.55 respectively (“I like resources in this college”), to a low of 2.44 for faculty members (“minimal extracurricular activities”) and 2.16 for students (“poor hostels”). However, much progress was under way in resource development; for example, by the end of 2016, the average library usage by students stood at 73.24%, which was noted to be an attribute of increased library resources such as e-books and 4G networks connecting hot points that were faster than previous 3G network.

On the faculty engagement latent variable, item means for faculties ranged from a high of 3.53 (“used examples and illustrations”) to a low of 2.56 (“offered minimal remedial teaching”); whereas, item means for students ranged from a high of 2.93 (“course relevance for future career”) to a low of 2.06 (“interaction with faculties off class time”). Under the peer engagement latent variable, item means for faculties ranged from a high of 3.01 (“students study together”) to a low of 2.18 (“interest in community services”); in contrast, item means for students ranged from a high of 3.26 (“paid attention in class”) to a low of 2.53 (“challenged by course work”). Lastly, for the socio-cultural engagement latent variable, item means for faculties ranged from a high of 3.50 (“tolerate students of different religions”) to a low of 2.28 (“reluctant to join college social groups”), while item means for students ranged from a high of 3.03 (“felt part of the college community”) to a low of 2.19 (“attended intercollegiate competitions”).

The one-way ANOVA Test was conducted on respondents’ demographic factors such as gender, residence status, faculty qualification, and area of specialisation, against the construct variables: resources and engagement. Homogeneity and Post-Hoc tests established that all demographic factors – gender (0.432; 0.103), students’ residence status (0.331; 0.203), academic qualification of faculty members (0.349; 0.215), and students’ area of specialization (0.065; 0.051) – were statistically not significant (p -value > 0.05). Technically, these factors were not considered a determinant factor since the homogeneity of variance assumption is reasonably satisfied. The inter-correlations among the latent variable had a highly positive correlation and were statistically significant: resources on learning outcomes (0.829; 0.000), resources on student engagement (0.942; 0.000), and student engagement on learning outcomes (0.921; 0.000).

Common Factor Analysis

The model presented in Figure 2 is a common factor analysis model of unobserved variables, with resources and engagement being the common factors. The path coefficients leading from common factors to the observed variables are the factor loadings. The overall model fits well with the data since χ^2 (552) yielded a value of 15.16, which on evaluating with 8 degrees of freedom had a corresponding p -value of 0.156 ($p < .05$). Furthermore, the values of GFI=0.872, CFI=0.943, NFI=0.942, RMR=0.019, and RMSE=0.028 were within the acceptable range (Kline, 2005). The regression weights are positive and so is the correlation between resources and engagement. The square multiple correlations were quite high; for example, the coefficient of faculty and socio-cultural engagement were both at 0.98. This implies that 98% of the variance was accounted for by faculty and socio-cultural engagement, with only 2% accounted for by unique variables e5 and e6.

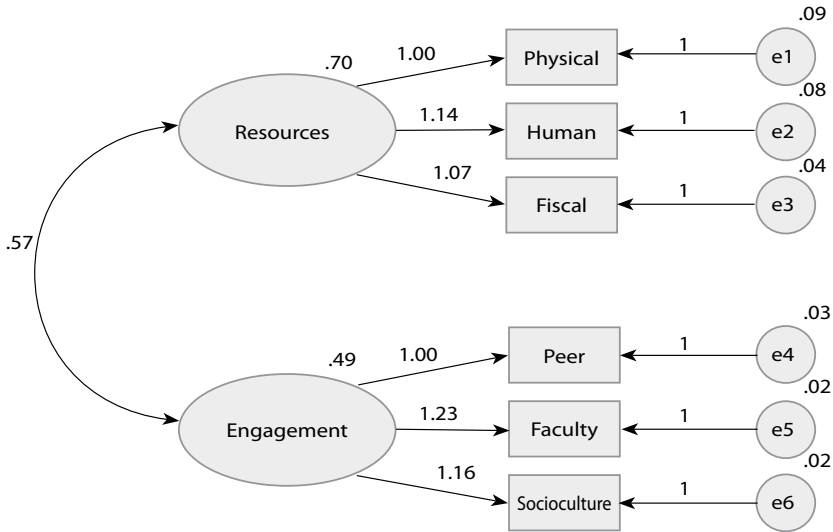


Figure 2. Common Factor Model

Direct and Indirect Effects

We constructed the SEM to analyse the direct and indirect effect of resources, engagement, and student learning outcomes based on findings in the literature. We assumed that resources directly affect student learning outcomes but in the presence of engagement resources indirectly affect student learning outcomes. Figure 3 shows that the coefficient of regression for resources is 0.62 and has a significant effect on achievement (p -value < 0.001).

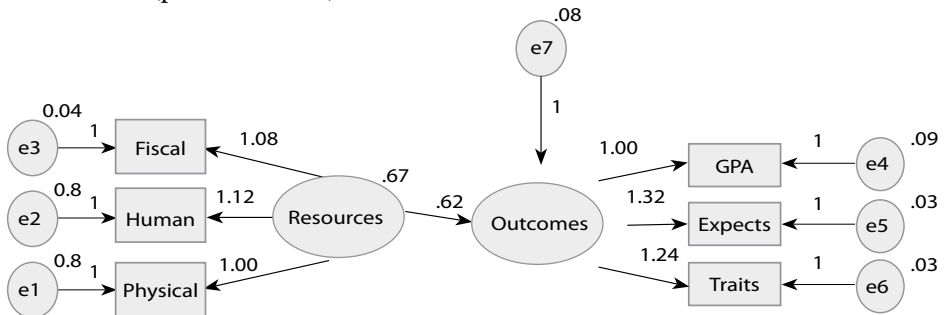


Figure 3. Structural Equation Model without Mediation Effects¹

When the mediator variable – student engagement – is introduced into the model, it was realised that the coefficient of regression for resources is reduced considerably from 0.62 to 0.01 and is no longer significant (p -value = 0.835). However, there is a statistically significant direct effect of resources on engagement (0.85; p < 0.001) and engagement on achievement (0.71; p < 0.001), as indicated in Figure 4.

¹ Expects (in the diagram) refers to learner expectations.

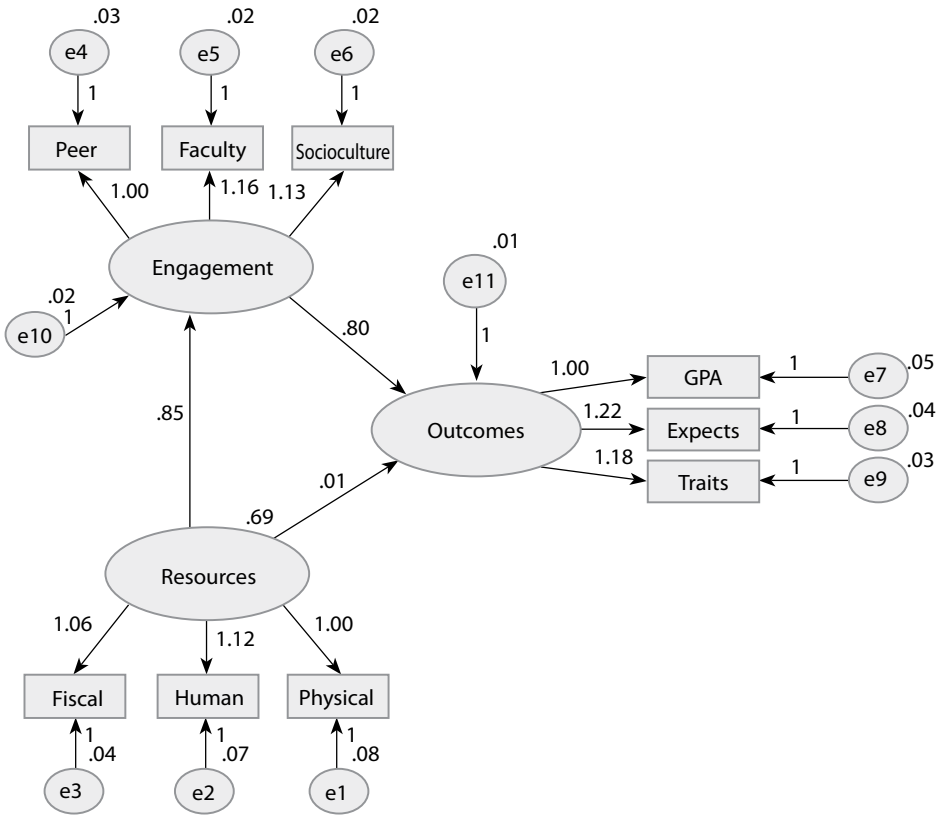


Figure 4. Structural Equation Model with Mediation Effects

It is apparent that engagement is the mediating variable in the relationship between resources and student learning outcomes. The type of mediation here is called *complete mediation* since the direct effect of resources on student learning outcomes is no longer significant after engagement has been introduced into the model; instead, the indirect effect is significant. Thus we reject the hypothesis that resources directly affect student learning outcomes and accept the hypothesis that resources have an indirect effect on student learning outcomes through the mediation of engagement (see Table 1). This implies that model equation 4 fits the present study well.

Table 1
Direct and indirect effects of independent variables on learning outcomes

			Estimate	S. E	C. R	P-value	Results
Outcomes	β	Resources	0.014	0.070	0.208	0.835	Not significant
Engagement	β	Resources	0.847	0.022	38.90	0.001	Significant
Outcomes	β	Engagement	0.707	0.072	9.851	0.001	Significant

Note. Before engagement was introduced to the model, coefficient of resources was 0.617***

Discussion

This study represents a careful and systematic analysis of the effects of resources and engagement on college student learning outcomes in the Coastal Region of Kenya. Applied here were: resources as the independent variable, engagement as the mediating variable, and student learning outcomes as the dependent variable. Although many studies have shown a statistically relevant and positive correlation between demographic factors such as residence status (Astin, 1999; Pascarella, Bohr, Nora, Zusman, Inman, & Desler, 1994), gender, and teacher qualification (Adeyemi & Adeyemi, 2014; Nurhadi, Zahro, & Lyau, 2017) on the one hand, and academic achievement on the other, the present study found out that gender, residence status, faculty qualification, and students' area of specialization did not lead to significant differences between the groups, and therefore, these factors were not considered determinant.

The findings regarding gender and faculty qualification were not unique (Kimani et al., 2013). Rivkin et al. (2005) who studied teacher factors influencing students' academic achievement, also discovered that gender and teacher qualification were not statistically significant for explaining students' academic achievement. Therefore, the results of faculty qualification suggest that additional qualifications beyond the first degree do not automatically improve teaching competence on the college level. In fact, most faculty members in Kenya, for example, who have obtained a postgraduate degree join universities and those left aspire for a different job. When it comes to students' residence status, Astin (1999) agrees that students working are actually academically engaged. Even students residing off campus often receive academic support as their parents may discuss their academic progress and provide educational enrichment at home.

Upon controlling respondents' demographic factors, hypotheses formulated in the introduction section were tested and the results revealed that: (1) for no engagement, resources were statistically significant and highly positively correlated with learning outcomes (0.829**), while the regression coefficient of resources was 0.62, with a significant effect on learning outcomes (p-values < 0.001); (2) when engagement, the mediator variable, enters the model, results shows a decline of the regression coefficient from 0.62 to 0.01, and the effect is no longer significant (p-value = 0.835). Therefore, *hypothesis 1 has been discarded*. However, there is a statistically significant and highly positive correlation between resources and engagement (0.942**), and engagement and learning outcomes (0.921**). Moreover, the regression coefficient of engagement is 0.71, with a significant effect on learning outcomes (p-values < 0.001). Consequently, the effects of engagement are real which is why *hypothesis 2 has been accepted*.

Moving beyond the testing of hypotheses to items means, the majority of the respondents' (both faculty members and students) scores rated student engagement higher in comparison to college resources (combined item means = 2.64 and 2.85 respectively). The results revealed that both faculties' and students' views of various aspects that can possibly enhance student learning outcomes are closely related to

student engagement. Even with a large proportion of faculty members and students expressing their satisfaction with the level of college resources (mean of 3.55 and 3.10 respectively), only 6 out of the 14 items under the latent variable of college resources had a mean above 2.5, whereas in the latent variable of student engagement all items scored a mean above 2.5 with the exception of two items.

These results show the central controversies surrounding much of the research on students' learning outcomes. Although many studies have linked school resources and academics (Greenwald & Hedges, 1996; Onyara, 2013), much more needs to be established. After all, in an influential series of papers, Hanushek (1998) concluded that there is no strong or consistent relationship between resources and student performance. This is possibly true because resources have been under-deployed or under-utilized many times. This is simply to say that exposing students to resources may or may not lead to academic success. However, for particular resources to meet their anticipated effects they must elicit enough effort from faculties and students to bring about the desired learning outcomes. This effort is guaranteed through engagement with peers, faculty members, and socio-cultural engagement.

There is no doubt that engagement greatly influences students' academic achievement (Astin, 1999; Pascarella et al., 1994; Tinto, 1987). Simply put, the more students are engaged with their peers, lecturers, and the socio-cultural context (all other things being constant), the more likely they are to succeed. Students who are engaged tend to achieve and enjoy learning activities more than those who are not. Of course, students who are more engaged achieve greater learning gains (Siming, Gao, & Xu, 2015). The results presented above elucidate the need for administrators and lecturers to recognize that institutional policies and practices can affect the way students devote their time in academic pursuits in order to promote their engagement. In short, the theory of engagement encourages educators to focus less on what they do and more on what the student does, as this will promote students' learning outcomes. Therefore, all college personnel should assess their own activities in terms of their success in encouraging students to become more involved in the college experience.

As a result of this discovery, colleges should incorporate peer engagement activities such as community work as part of class assignments, active learning in groups, social cultural interaction, and peers' relations to engage learners. Academic socialization practices such as discussion about academic topics and fostering educational aspirations are also effective in promoting learning outcomes (Astin, 1999). Faculty members should take the lead role in promoting active and collaborative learning since they are at the centre of knowledge transformation as featured in many top liberal art colleges. This is evident, for instance in the United States, where colleges such as Williams College recruit high-achieving faculty members, and the student to faculty ratio is as low as 7:1 (U.S. News & World Report, 2017). Furthermore, disengaged students should be identified and involved in educationally purposeful activities such as challenging classwork. This ensures that they will make more appointments with their faculty members, thereby promoting faculty engagement. Similarly, faculty members can create opportunities for

peer evaluation as students work with classmates on academic tasks and assignments outside the class to promote peer learning. Besides, colleges should involve parents in their children's academic matters so as to make them more aware.

Finally, administrators in charge of students' affairs should incorporate counselling in college programmes to include career progression. Many students attending colleges fall short of their career goals. Others cannot cope with academic expectations thereby exhibiting apathy towards learning that results in poor academic performance. For an institution that is committed to maximum student engagement, student counsellors probably occupy a more important role in institutional operations. Through the support of staff and peers, counsellors can identify activities in which a student is currently involved. This can help determine if his/her academic difficulties stem from a lack of motivation or poor study habits, and hence a solution can be sought. Additionally, involving students in making the decisions that affect them through student governing bodies or open forums where they can discuss the challenges they face, helps bridge the gap between students and administrators, which creates harmonious college life.

Limitations and Implications for Future Research

Despite the fact that our study has provided a valuable contribution to existing literature, some areas need further investigation. Firstly, it is necessary to consider colleges in other parts of the country and conduct a cross-comparison with other countries in the world. Though the sampled colleges enrol faculty members and students from all parts of the country, the effects of resources and engagement may differ due to geographical location. Secondly, future research should look at the longitudinal process of students' performance as reflected in longitudinal follow-up data rather than cross-sectional data only. This would require a detailed follow-up of entering cohorts of individuals in various types of higher educational institutions, which, in turn, would enable meaningful comparative analyses of institutional impacts on students' achievement behaviour. Furthermore, the analyses should follow longitudinal regression such as logit analysis equations according to selected categories of interest as a means of dealing with the problem of conducting regression analysis when qualitative dependent variables are present.

Thirdly, this study addresses faculty members' and students' perception of college resources and the impact of their engagement with these resources on learning outcomes. Thus, it is not known how well these perceptions reflect actual conditions. For example, significant variations among persons supporting variables according to religion, culture, or political inclination may exist. To improve the actual condition, future research may need to consider collecting data on the actual conditions of college resources and student engagement.

Finally, since the present study was narrowed to college resources and student engagement with students' learning outcomes while controlling for demographic factors, we suggest the inclusion of a moderating variable in the model. The present study investigated four demographic factors that were found to have no effect on learning

outcomes. Future scholars can include more factors such as faculty experience, students' study status, students' economic status, and the education level of students' parents, which might affect students' learning outcomes.

Implications for Higher Education and Practice

The results of this study provide several potential implications for practitioners. Firstly, it is vital to recognize the contributions of college resources and student engagement on learning outcomes since they form part of ongoing professional issues in education. Secondly, when helping students experiencing academic challenges, school leaders should make decisions about the availability of college resources and the quality of student interaction in a given college. The results of this study established that student engagement is the perfect mediator of resources and learning outcomes, which implies that resources should be evaluated based on how they enhance student engagement. Thus, for low-performing students, faculty members and college administrators should investigate the quality of student interaction (with faculty members, peers, and the socio-cultural context) with the college resources. Furthermore, there is a need for colleges and universities to be aware of the elements surrounding student engagement so that they are fully involved in providing an educational experience that enhances the development of achievement predictors, some of which have been shown by this study to be directly related to student learning outcomes. This approach may lead to an enhanced college experience, which, in turn, may result in students' academic success.

Conclusion

Too much of research on students' learning outcomes focuses on events often external to the college that do not have an immediate effect on it. Though informative, such research does not lead to reasonable policies and practices. In moving towards the identification of a possible model of institutional action, the present study relies on theories and past research to design a model based on two conditions (resources and engagement) that are under the control of institutions for which students' learning outcomes can be obtained. The results show that when college resources are mobilised in a way that makes learning captivating and interesting, students will succeed. Furthermore, when college students are engaged, they learn more and achieve greater degrees of personal development. Our study therefore recommends that this model be effectively applied in colleges to serve as a guiding principle when implementing college policies. From the standpoint of educators, resources should be evaluated in terms of the degree to which they increase engagement. More specifically, faculties should be at the front line of promoting students' engagement since they are at the centre of knowledge transformation.

Acknowledgement

This work was supported by the National Office of Education Sciences and Planning in China under the Grant BIA170190. The authors have not declared any conflict of interest.

References

- Abbasi, A. S., & Mir, G. M. (2012). Impact of Teacher's Ability, Student's Work Ethics and Institutional Environment on Student Performance of University of Gujrat. *Middle-East Journal of Scientific Research*, 12(4), 572–579.
- Adeyemi, A., & Adeyemi, S. (2014). Institutional factors as predictors of students academic achievement in colleges of education in South-western Nigeria. *International Journal of Educational Administration and Policy Studies*, 6(8), 141–153. <https://doi.org/10.5897/IJEAPS2014.0342>
- Altermatt, E. R., & Pomerantz, E. M. (2005). The implications of having high-achieving versus low-achieving friends: A longitudinal analysis. *Social Development*, 14(1), 61–81. <https://doi.org/10.1111/j.1467-9507.2005.00291.x>
- Astin, A. W. (1999). Student involvement: A developmental theory for higher education. *Journal of College Student Development*, 40(5), 518–529.
- Astin, A. W., & Antonio, A. L. (2012). *Assessment for Excellence: The Philosophy and Practice of Assessment and Evaluation in Higher Education*. Rowman & Littlefield Publishers. Retrieved from <http://books.google.co.uk/books?id=U2oPnZzpmKAC>
- Baron, R. M., & Kenny, D. A. (1986). The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182. <https://doi.org/10.1037/0022-3514.51.6.1173>
- Bellhouse, D. R., & Kulperger, R. J. (1991). Computer generated simple random samples. *Communications in Statistics - Simulation and Computation*, 20(2), 539–550. <https://doi.org/10.1080/03610919108812971>
- Broh, B. A. (2010). Linking Extracurricular Programming to Academic Achievement: Who Benefits and Why? *Sociology of Education*, 75(1), 69–95. <https://doi.org/10.2307/3090254>
- Bryson, C., & Hand, L. (2007). The role of engagement in inspiring teaching and learning. *Innovations in Education and Teaching International*, 44(4), 349–362. <https://doi.org/10.1080/14703290701602748>
- Carini, R. M., Kuh, G. D., Klein, S. P., & Kleint, S. P. (2014). Student Engagement and Student Learning: Testing the Linkages. *Research in Higher Education*, 47(1), 1–32. <https://doi.org/10.1007/s11162-005-8150-9>
- Chang, S. S. (2014). Family background, study time, and academic achievement: Korea in a comparative perspective. *Studies on Korean Youth*, 25(2), 291–318. <https://doi.org/10.14816/sky.2014.25.2.291>
- Cofer, J., & Somers, P. (2000). A Comparison of the Influence of Debtload on the Persistence of Students at Public and Private Colleges. *Journal of Student Financial Aid*, 30(2), 39–58. Retrieved from <http://publications.nasfaa.org/jsfa/vol30/iss2/3>
- DesJardins, S. L., Ahlburg, D. A., & McCall, B. P. (2002). Simulating the longitudinal effects of changes in financial aid on student departure from college. *The Journal of Human Resources*, 37(3), 653–679. <https://doi.org/10.2307/3069685>
- Ewell, P. (2006). Applying student learning outcomes concepts and approaches at Hong Kong Higher Education Institutions: Current status and future directions. *National Center for*

- Higher Education Management*, 54(2), 1–21. Retrieved from http://www.ied.edu.hk/obl/files/OBA_2nd_report.pdf%5Chttp://www.cetl.hku.hk/system/files/OBA_2nd_report.pdf
- Field, A. (2005). *Factor Analysis Using SPSS* (Lecture notes). Retrieved from <http://www.statisticshell.com/docs/factor.pdf>
- Greenwald, R., & Hedges, L. (1996). The effect of school resources on student achievement. *Review of Educational Research*, 66(3), 361–396. Retrieved from <http://journals.sagepub.com/doi/abs/10.3102/00346543066003361>
- Gu, X. (2003). Strategy on the resources development of school physical education. *Journal of Physical Education*, 4, 0–35.
- Hanushek, E. (1998). Conclusions and controversies about the effectiveness of school resources. *Economic Policy Review*, 4(1), 11–27. Retrieved from <http://ideas.repec.org/a/fip/fednep/y1998imarp11-27nv.4no.1.html>
- Hanushek, E. A. (2016). Education Production Functions. In S. N. Durlauf, & L. E. Blume (Eds.), *The New Palgrave Dictionary of Economics* (pp. 33–42). Basingstoke: Palgrave Macmillan.
- Hossler, D., Ziskin, M., Kim, S., Cekic, O., & Gross, J.P.K.. (2008). Student Aid and Its Role in Encouraging Persistence. In S. Baum, M. McPherson, & P. Steele (Eds.), *The Effectiveness of Student Aid Policies. What the Research Tells Us* (pp. 101–116). New York: College Board.
- Johnson, D. R., Soldner, M., Leonard, J. B., Alvarez, P., Inkelas, K. K., Rowan-Kenyon, H. T., & Longerbeam, S. D. (2007). Examining sense of belonging among first-year undergraduates from different racial/ethnic groups. *Journal of College Students Development*, 48(5), 525–542. <https://doi.org/10.1353/csd.2007.0054>
- Kim, E. (2015). Effect of discussion activities and interactions with faculty to mediate self-directed learning capability on learning outcomes of college students. *KEDI Journal of Educational Policy*, 12(2), 173–196.
- Kimani, G. N., Kara, A. M., & Njagi, L. W. (2013). Teacher Factors Influencing Students' Academic Achievement in Secondary Schools in Nyandarua County, Kenya. *International Journal of Education and Research*, 1(3), 1–14.
- Kline, R. B. (2005). *Principles and Practice of Structural Equation Modeling*. 2nd ed. New York: Guilford Press.
- KNEC (2016). *Kenya National Examination Council TVET examination results*. Retrieved from https://www.knec.ac.ke/home/index.php?option=com_phocadownload&view=category&id=84:results
- Krause, K. (2005). Understanding and promoting student engagement in university learning communities. Paper presented as keynote address: Engaged, Inert or Otherwise Occupied?: Deconstructing the 21st Century Undergraduate Student. In *James Cook University Symposium "Sharing Scholarship in Learning and Teaching: Engaging Students"* James Cook University (pp. 21–22). Retrieved from http://cshe.unimelb.edu.au/resources_teach/teaching_in_practice/docs/Stud_eng.pdf
- Kuh, G. D. (2003). What we're learning about students engagement from NSSE. *Change*, 35(32), 24–32. <https://doi.org/10.1080/00091380309604090>
- Lee, J., & Paek, I. (2014). In Search of the Optimal Number of Response Categories in a Rating Scale. *Journal of Psychoeducational Assessment*, 32(7), 663–673. <https://doi.org/10.1177/0734282914522200>

- Maroulis, S., & Gomez, L. M. (2008). Does “connectedness” matter? Evidence from a social network analysis within a small-school reform. *The Teachers College Record*, 110(9), 1901–1929. Retrieved from <http://www.tcrecord.org/Content.asp?ContentId=15176>
- Marzano, R. J. (2004). *Building background knowledge for academic achievement: Research on what works in schools*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Mostafa, T. (2010). Decomposing inequalities in performance scores: The role of student background, peer effects and school characteristics. *International Review of Education*, 56(5–6), 567–589. <https://doi.org/10.1007/s11159-010-9184-6>
- Musau, L. M., & Migosi, J. A. (2014). Instructional resources and girls’ academic achievement in Science, Mathematics and Technology subjects: experiences from Kenya. *International Journal of Education Economics and Development*, 5(2), 140–151. <https://doi.org/10.1504/IJEED.2014.061452>
- Nurhadi, D., Zahro, S., & Lyau, N. M. (2017). A Retrospective on Educational Policies and Their Implementation in Vocational Teacher Education Provision. *Croatian Journal of Education*, 19(3), 947–980. <https://doi.org/10.15516/cje.v19i3.2356>
- Omulo, C. (2017). Fred Matiang’s asks vassities to offer quality education. *Daily Nation Newspaper*. Retrieved from <https://www.nation.co.ke/news/education/Varsities-urged-to-offer-quality-education/2643604-3885374-riscbb/index.html>
- Onyara, B. N. (2013). *School based factors influencing student’s academic performance at Kenya Certificate of Secondary Education in Teso South District*. Unpublished thesis. University of Nairobi.
- Pascarella, E. T., Bohr, L., Nora, A., Zusman, B., Inman, P., & Desler, M. (1994). Cognitive Impacts of Living on Campus Versus Commuting to College. *Journal of College Student Development*, 34(3), 216-220.
- Peterson, R. A. (1994). A meta-analysis of Cronbach’s coefficient alpha. *Journal of Consumer Research*, 21(2), 381–391. <https://doi.org/10.1086/209405>
- Pittaway, S., & Moss, T. (2006). Contextualising student engagement: Orientation and beyond in teacher education. Paper presented at the 9th Pacific Rim First Year in Higher Education Conference: *Engaging Students*. Griffith University, Gold Coast, Australia, 12–14 July.
- Porter, S. R. (2006). Institutional structures and student engagement. *Research in Higher Education*, 47(5), 521–558. <https://doi.org/10.1007/s11162-005-9006-z>
- Reason, R. D., Terenzini, P. T., Domingo, R. J., & Domingo, R. J. (2010). First Things First : Developing Academic Competence in the First Year of College. *Research in Higher Education*, 47(2), 149–175. <https://doi.org/10.1007/s11162-005-8884-4>
- Revilla, M. A., Saris, W. E., & Krosnick, J. A. (2013). Choosing the Number of Categories in Agree-Disagree Scales. *Sociological Methods & Research*, 43(1), 73–97. <https://doi.org/10.1177/0049124113509605>
- Rivkin, S. G., Hanushek, E. A., & Kain, J. F. (2005). Teachers, schools, and academic achievement. *Econometrica*, 73(2), 417–458. <https://doi.org/10.1111/j.1468-0262.2005.00584.x>
- Rugutt, J. K., & Chemosit, C. C. (2005). A Study of Factors that Influence College Academic Achievement: A Structural Equation Modeling Approach. *Journal of Educational Research & Policy Studies*, 5 (1), 66–90.

- Singell, L., & Stater, M. (2012). Going, Going, Gone: The Effects of Aid Policies on Graduation at Three Large Public Institutions. *Policy Sciences*, 39(4), 379–403. <https://doi.org/10.1007/s11077-006-9030-7>
- Siming, L., Gao, J., & Xu, D. (2015). Factors leading to students' satisfaction in the higher learning institutions. *Journal of Education and Praticce*, 6(31), 114–118.
- Tinto, V. (1987). *Leaving College: Rethinking the Causes and Cures of Student Attrition*. Chicago: University of Chicago Press.
- U.S. News & World Report. (2017). Best national liberal arts colleges. *Web log post*. Retrieved from <http://www.usnews.com/best-college/ranking/national-liberal-artscolleges>
- Wanjala, G., & Malechwanzhi, J. M. (2016). Improving the Quality of Technical Education Through International Standardization: The Case of Coast Institute of Technology, Kenya. In I. H. Anzat, & B. Yusuf (Eds.), *Fast Forwarding Higher Education Institutions for Global Challenges* (pp. 185–203). Singapore: Springer.
- Willms, J. D. (2003). Student engagement at school: A sense of belonging and participation. *OECD*. Retrieved from <http://www.oecd.org/education/school/programmeforinternationalstudentassessmentpisa/33689437.pdf>
- Zepke, N., & Leach, L. (2010). Improving student engagement: Ten proposals for action. *Active Learning in Higher Education*, 11(3), 167–177. <https://doi.org/10.1177/1469787410379680>

Joseph Malechwanzhi

Huazhong University of Science and Technology,
School of Education
1037 Luoyu Road, 430074, Wuhan, China
josephmuthiani@yahoo.com
l201522174@hust.edu.cn

Lei Hongde

Huazhong University of Science and Technology,
School of Education
1037 Luoyu Road, 430074, Wuhan, China
leihongde@hust.edu.cn

Odnos između resursa visokih učilišta i rezultata učenja: razmatranje posredničkog učinka studentske angažiranosti

Sažetak

Cilj ovog rada jest istražiti odnos između resursa visokih učilišta i rezultata učenja posredovanjem studentske angažiranosti. Oslanjajući se na podatke prikupljene od 430 studenata i 122 obrazovne ustanove diljem obalne regije Kenije, koristili smo se statističkim modelom utemeljenim na strukturnim jednadžbama sa svrhom ispitivanja modela koji upućuje na odnos između resursa učilišta i rezultata učenja. Uzimajući studentski angažman kao parametar, rezultati statističke analize pokazali su da resursi obrazovnih ustanova imaju značajan i neizravan učinak na rezultate učenja studenata. Koeficijent regresije resursa učilišta u odnosu na rezultate učenja smanjen je s 0.62 na 0.01, te postaje beznačajan kad se modelu pridoda studentska angažiranost. Rezultati pokazuju da učinke resursa učilišta treba ocijeniti u kontekstu njihova utjecaja na uvećanje angažmana studenata. U radu se raspravlja i o implikacijama za praksu, kao i o daljnjim pravcima istraživanja.

Ključne riječi: *okolina; postignuće; strukovno učilište; uključenost.*

Uvod

Pozadina istraživanja

U gotovo svim afričkim zemljama zabilježen je pojačan zahtjev za pristupom visokom obrazovanju, koji dovodi do maksimalnog iscrpljivanja dostupnih resursa. Broj studenata na ustanovama visokog obrazovanja u neprestanom je porastu, stvarajući niz izazova većinom vezanih uz kvalitetu obrazovanja. Od nedavno se sve više pozornosti pridaje uspostavljanju ravnoteže između kvantitete i kvalitete u smislu da će povećanje upisnih kvota bez određenih zajamčenih standarda visoko obrazovanje učiniti neučinkovitim. Poboljšanje kvalitete osposobljavanja pridonosi stvaranju novih prilika i dobiti za osobni, društveni i ekonomski razvoj (Kimani, Kara, i Njagi, 2013). Usljed postojeće situacije, javnost i mnoge vlade zahtijevaju da učilišta unaprijede kvalitetu osposobljavanja. Napredovanje i dosezanje viših razina u visokom obrazovanju zahtijeva da najprije sagledamo potrebe studenata i prirodu njihovih rezultata učenja.

Primjerice, u Keniji je kvaliteta obrazovanja na visokim učilištima u fazi razvojnog nacrtu s pomoću kojega se država planira prometnuti u industrijaliziranu zemlju do 2030. godine. U izjavi za novinare Ministarstvo obrazovanja je od učilišta zatražilo da uspostave strukture koje će studentima omogućiti stjecanje kvalitetnog i relevantnog obrazovanja (Matiang'i, 2017). Usprkos postojećem pritisku za uspostavljanje i dosizanje određenih akademskih standarda, studenti na brojnim učilištima, naročito u priobalnim područjima Kenije, ostvaruju slabe rezultate u nacionalnim ispitima (KNEC, 2016). Izvještaji sugeriraju da nakon što se upišu na ustanovu visokog obrazovanja, njihov interes slabi, a razina njihove angažiranosti se smanjuje, što dovodi do slabijih rezultata. Budući da vrijeme provedeno u učenju čini velik dio studentskog života, odgovorni bi trebali prilagoditi obrazovne strukture tako da one uključuju ugodna i pozitivna iskustva učenja koja bi, pak, proizvela ciljne rezultate.

U potrazi za visokom kvalitetom učenja istraživači tvrde da institucije s neodgovarajućim resursima često iscrpljuju postojeće resurse, tjerajući svoje predavače da se prilagode (često kompromitiranjem vlastite metodologije), što u konačnici dovodi do slabih rezultata (Onyara, 2013). Resursi kao što su kvaliteta fakulteta, osobine studenata, okolina za učenje, službe i infrastruktura, organizacija kurikula također imaju ulogu u promoviranju kvalitete obrazovanja. Međutim, interakcijski učinak koji postoji između tih resursa i akademskih rezultata zahtijeva postojanje pogodne okoline. Općenito uzevši, kvaliteta i rezultati učenja dobivaju na kvaliteti u slučajevima kada su studenti zainteresirani i angažirani, a gube na kvaliteti kada nisu. Odnedavno se istraživači koriste pojmom studentske angažiranosti kako bi označili stupanj do kojega se studenti identificiraju i vrednuju rezultate školovanja sudjelovanjem u nastavnim i izvannastavnim aktivnostima (Willms, 2003).

Ovaj rad istražuje dvije teorije obrazovanja, točnije resurse i angažiranost, te njihove poveznice s rezultatima učenja studenata na visokim učilištima. Ukratko, ovaj rad sugerira da akademski uspjeh ovisi o angažiranosti studenata i njihovoj interakciji s resursima učilišta. Oslanjajući se na vlastite resurse, učilišta su u stanju studentima ponuditi okolinu koja će odrediti pripremu za obrazovni sadržaj, a angažiranost studenata ima veliku ulogu u procesu poučavanja i učenja. Oba aspekta imaju ključnu ulogu u akademskim postignućima. Ovo istraživanje stoga za cilj ima utvrditi postoji li poveznica između resursa visokih učilišta i angažmana studenata s jedne strane i rezultata učenja u priobalnoj regiji u Keniji s druge. Empirijske spoznaje istraživanja nude vrijedne uvide u međusobnu povezanost varijabli nužnih za kvalitetno i učinkovito iskustvo studenata na visokim učilištima.

Obrazloženje istraživanja

Dok su brojna istraživanja posvećena jednodimenzionalnom učinku varijabli koje utječu na rezultate učenja studenata – točnije, institucionalnim resursima (Musau i Migosi, 2014) i utjecaju obitelji (Chang, 2014) – malo je onih koja se bave poveznicama između resursa visokih učilišta, studentske angažiranosti i rezultata učenja studenata.

Osim toga, većina istraživanja tog tipa posvećena je osnovnom obrazovanju i kao takva je od minimalne važnosti za istraživanje visokog obrazovanja. Uz malobrojne iznimke kao što je istraživanje odnosa rasprava i interakcije s predavačima o rezultatima učenja studenata putem posredničkih učinaka samousmjerene sposobnosti učenja (Kim, 2015), postojeće studije uglavnom zanemaruju strukturni odnos između prediktorskih varijabli koje utječu na rezultate učenja.

Kako bi se odgovorilo na postojeće izazove, nužno je uspostaviti poveznice između resursa visokih učilišta, angažmana i rezultata studenata koristeći se podacima i validnim mjerama. To, pak, od učilišta zahtijeva da izbjegavaju predrasude vezane uz učinkovitost njihovih politika i praksi u slučaju manjka informacija o kvaliteti iskustva studenata. Ovo istraživanje ispunjava te praznine analizirajući odnos i izravan ili neizravan učinak varijabli resursa učilišta i studentske angažiranosti na rezultate učenja studenata. Cilj ovdje predstavljenog istraživanja stoga je analizirati odnose koji postoje između resursa učilišta, studentske angažiranosti i rezultata učenja studenata. Postavili smo sljedeće hipoteze: 1) u slučaju manjka angažiranosti, resursi učilišta izravno utječu na rezultate učenja studenta; i 2) resursi učilišta neizravno utječu na rezultate učenja studenata putem angažiranosti. Ovdje predstavljeno istraživanje otvara prostor za daljnje hipoteze, uvećavajući na taj način mogućnost proširivanja postojećeg znanja i podizanja razine visokog obrazovanja.

Pregled literature

Studentski rezultati učenja

Rezultate učenja studenata tradicionalno se definira preko poveznica s određenim razinama znanja, vještina i sposobnosti koje studenti stječu po završetku određenog iskustva učenja i poučavanja (Ewell, 2006). Može se pretpostaviti da se sve što se studentu dogodi kao posljedica pohađanja visokog učilišta ili sudjelovanja na nastavi određenog predmeta može smatrati rezultatom učenja. Velik broj istraživanja studentskih rezultata učenja koristi se skalama standardiziranih testova uspješnosti, poput prosjeka ocjena, sa svrhom mjerenja akademskog uspjeha (Hanushek, 2016); neka se istraživanja, pak, oslanjaju na druge sustave mjerenja kao što su karakteristike studenata (Astin, 1999), postotak studenata koji su prekinuli studij (Tinto, 1987), znanja i vještine (Ewell, 2006). U institucijama visokog obrazovanja za rezultate učenja utvrđeno je da su predmet raznih ulaznih varijabli. Međutim, oprečni rezultati ne pokazuju slaganje kad je riječ o specifičnim varijablama koje utječu na rezultate učenja (Rivkin, Hanushek, i Kain, 2005). Istraživači su identificirali varijable koje stvaraju promjene kojima studenti streme. Takav tip varijabli u obzir uzima optimalne načine na koje je moguće učiti uz pomoć odgovarajućeg planiranja materijala i aktivnosti.

Resursi visokih učilišta

Mnogi administratori na visokim učilištima na vrh svojih popisa prioriteta smještaju stjecanje resursa. U kontekstu institucija visokog obrazovanja pojam resursa obuhvaća

niz komponenata za koje se smatra da promoviraju proces učenja i koje uključuju ljudske, fiskalne i fizičke resurse. Teorija resursa tvrdi da je mobilizacija dovoljne količine resursa na jednome mjestu preduvjet stvaranja pozitivnih rezultata studentskog učenja.

Fizički resursi

Fizički resursi imaju važnu ulogu u utvrđivanju uspješnosti studenata (Abbasi i Mir, 2012). Učionice, laboratoriji, knjižnice, igrališta i udžbenici tek su neki od fizičkih resursa koji, tvrdi Gu (2003), promiču procese učinkovitog poučavanja i učenja, a time i obrazovni razvoj studenata. Osiguravanje vrhunske opreme u obrazovnim institucijama unapređuje kvalitetu i važnost vještina koje se želi poučiti. Razlog tomu leži u činjenici da proces učenja podrazumijeva interakciju između studenata i njihove okoline. Ustanovljeno je da dostupnost odgovarajućih fizičkih resursa predstavlja značajan doprinos akademskim postignućima studenata (Adeyemi i Adeyemi, 2014).

Ljudski resursi

Ljudski resursi, posebno brojčani odnos predavača i studenata, administrativna pravila, zatim kvaliteta predavača i studenata, utvrđuju kvalitetu akademskih postignuća. Kvalitetno osposobljeni predavači posjeduju pedagoške vještine koje promiču razumijevanje studenata, a nizak brojčani odnos između učenika i predavača potiče bolje rezultate učenika i osobni razvoj. Ta dva aspekta unose kompromis u perspektivu kvalitete (obrazovano i osposobljeno nastavno osoblje) i kvantitete (nepovoljan omjer predavača i studenata) koju nudi teorija resursa. Istraživanja o karakteristikama studenata i akademskim postignućima otkrivaju da (među ostalim kriterijima) upisne ocjene (Marzano, 2004) i socio-ekonomski status (Chang, 2014) predstavljaju ozbiljnu prepreku postizanju rezultata učenja.

Fiskalni resursi

Nedavno su utvrđeni oprečni rezultati odnosa između fiskalnih resursa, poglavito financijske pomoći, i postignuća studenata (Hossler, Ziskin, Kim, Cekic, i Gross, 2008). Singell i Stater (2012) utvrdili su da financijska pomoć nema neovisan utjecaj na akademsko postignuće, ali da pomoć utemeljena na zaslugama privlači studente koji pokazuju karakteristike koje se najčešće povezuju s većim izgledima za postizanje akademske izvrsnosti. Nasuprot tome, utvrđeno je da stipendije imaju snažan pozitivan učinak na akademska postignuća (Cofer i Somers, 2000). Procjena specifičnog učinka financijske pomoći utemeljene na postignućima odnosno potrebi otkriva poglavito pozitivan odnos između oblika pomoći i akademskog uspjeha (DesJardins, Ahlburg, i McCall, 2002).

Studentski angažman

Australsko vijeće istraživanja obrazovanja definira studentsku angažiranost kao sudjelovanje studenata u aktivnostima i kontekstima za koje je vjerojatno da će

kreirati učenje visoke kvalitete (Zepke i Leach, 2010). Teorija studentske angažiranosti definira procese i oblike interakcije koji se odvijaju u školama i koji mogu promovirati akademska postignuća svih studenata, pri čemu studenti imaju koristi od bliske suradnje s vršnjacima, nastavničkog pristupa aktivnom učenju i od društvene konstelacije. Ovaj rad sintetizira literaturu nastalu iz očista raznolikih znanstvenih perspektiva i razvija konceptualni okvir organiziran oko tri pristupa angažiranosti. Svaki pristup nudi prijedloge koji zajednički tvore spoj studentske angažiranosti, kao i vrijedan uvid u to što djeluje poticajno na uspjeh studenata i zašto.

Vršnjački angažman

Programi studentske orijentacije i studentski domovi u znatnoj mjeri pridonose stvaranju društvenih kontakata među studentima izvan konteksta učionice. Orijentacijski procesi izdvajaju se kao poseban izvor pomoći studentima u procesu prilagodbe akademskom životu putem stvaranja društvenih poveznica s vršnjacima, mentorima i članovima osoblja, kako bi ih se upoznalo s kampusom i očekivanjima vezanim uz akademski život i studiranje (Pittaway i Moss, 2006). Ovdje je najvažnije naglasiti da je utvrđena pozitivna poveznica između akademskih postignuća unutar vršnjačke skupine s jedne, kao i akademskih postignuća pojedinačnih studenata unutar te skupine s druge strane (Altermatt i Pomerantz, 2005). To upućuje na zaključak da studenti okruženi vrlo gustim mrežama vršnjaka i kolega s visokim stupnjem postignuća ostvaruju bolje rezultate od studenata koji su okruženi mrežama vršnjaka i kolega s niskim stupnjem postignuća (Maroulis i Gomez, 2008). Nadalje, emocionalna podrška i prijateljstvo također djeluju poticajno na akademski uspjeh, a odbacivanje od vršnjačke skupine ima štetan učinak.

Nastavnički angažman

U svom opsežnom pregledu literature Carini, Kuh, Klein, i Kleint (2014) smještaju poučavanje i nastavnike u samo središte angažiranosti. Zaposlenici institucija visokog obrazovanja djeluju kao sučelje za prijenos znanja, vrijednosti i vještina u procesu učenja. Angažiranost studenata mnogo je vjerojatnija u slučajevima u kojima postoji podrška od članova nastavnog osoblja koji stvaraju prijateljsku okolinu za učenje, zahtijevaju visoke standarde i stoje studentima na raspolaganju za rasprave o njihovu akademskom napretku (Bryson i Hand, 2007). Reason, Terenzini, Domingo, i Domingo (2010) utvrdili su značajno poboljšanje akademskih rezultata među studentima prve godine koji osjećaju da ih njihovi predavači podržavaju. Kod studenata koji ne osjećaju tu vrstu podrške izostaje poboljšanje rezultata. Stoga je na nastavnicima da potiču svoje studente stvaranjem bogatih obrazovnih iskustava koji će im omogućiti da maksimalno razvijaju vlastite ideje.

Društveno-kulturni angažman

Studente, posebno članove manjina, valja usmjeriti na to da se oslanjaju na društveno-kulturni kapital nužan za angažiranost i uspjeh unutar i izvan učionice. Taj se društveno-

kulturni kapital razvija putem osjećaja pripadnosti, aktivne interakcije s drugima, kao i upoznatosti s principima prema kojima određene stvari djeluju (Krause, 2005). Kultura institucije ključna je za angažiranost studenata i kao takva mora podržavati proces učenja (Porter, 2006). Institucije se moraju mijenjati i stvarati kulturu koja u većoj mjeri podržava različitosti studenata (Johnson, Soldner, Leonard, Alvarez, Inkelas, Rowan-Kenyon, i Longerbeam, 2007). Na kraju, fakulteti bi trebali proširiti područja obuhvaćena izvannastavnim aktivnostima kako bi ona uključila aspekte poput vodstva, društvenog života, klubova i igara koji pridonose povezivanju iskustva učenja i društvene interakcije što, pak, pomaže u stvaranju i promoviranju zadovoljavajućeg iskustva visokog obrazovanja među studentima. Sudjelovanje u izvannastavnim aktivnostima korisno je sredstvo putem kojega studenti stječu akademska i društvena iskustva (Broh, 2010).

Teorijski okvir

Ovdje predstavljeno istraživanje oslanja se na funkciju proizvodnje obrazovanja prema kojoj se unosi prerađuju u rezultate (Hanushek, 2016). U našem konkretnom slučaju to znači primjenu ekonomskog koncepta proizvodne funkcije na područje obrazovanja. Obrazovni se sustav tumači kao produktivan sustav povezan s poboljšanjem različitih unosa koji utječu na poboljšanje studentskih rezultata učenja. Željene rezultate ili akademski položaj moguće je ostvariti preko odgovarajućih procesa poučavanja i učenja. Posljedica je toga da uspjeh studenata ovisi o tome koliko se učinkovito nastavnici i studenti koriste unosima u procesima poučavanja i učenja. Nedavna se istraživanja u sve većoj mjeri odmiču od strogo linearne progresije nudeći alternative tradicionalnom, neposredovanom modelu funkcije obrazovne produkcije koji podrazumijeva pretvorbu unosa u rezultate. Taj alternativni model sugerira da bi unosi mogli izravno utjecati na procese kao i na rezultate. Jedan takav model je Astinov I-E-O model koji obuhvaća unose (eng. *inputs*), okolinu (eng. *environment*) i rezultate (eng. *outputs*; Astin i Antonio, 2012).

Modeliranje prediktora rezultata učenja za studente visokih učilišta

Ovaj rad oslanja se na istraživanja renomiranih znanstvenika kako bi osmislio nov, sveobuhvatan modela utjecaja visokog obrazovanja. Taj model obuhvaća tri komponente: resurse institucija visokog obrazovanja, angažiranost studenata i njihove rezultate učenja. Prikaz 1 ilustrira odnose među trima komponentama tog konceptualnog modela. Primarni cilj ovdje predstavljenog istraživanja jest ocijeniti sljedeće odnose: (A) učinak resursa na angažiranost, (B) učinak angažiranosti na rezultate učenja i (C) učinak resursa na rezultate učenja. Osim toga, istraživači su ispitali učinke interakcije resursa i angažiranosti s jedne, a akademskog postignuća (AB) s druge strane.

Slika 1

Istraživačka metodologija

Cilj ovog istraživanja, razvijenog unutar spomenutog okvira, jest utvrditi povezanost između resursa i angažiranosti s jedne i rezultata učenja studenata visokih učilišta u obalnoj regiji Kenije s druge strane. U tom je smislu polazna točka istraživanja sljedeće pitanje: koji su stavovi nastavnika i studenata prema resursima i kakav učinak upotreba tih resursa ima na rezultate učenja studenata?

Dizajn

Ovdje predstavljeno istraživanje koristi se kvantitativnim i višesektorskim pristupom istraživanju. Budući da se resurse i angažman koji utječu na rezultate učenja i inherentni su institucijama visokog obrazovanja može promatrati i mjeriti, kvantitativni se pristup pokazao učinkovitijim u procesu prikupljanja podataka. Istraživanje se također koristi višesektorskim pristupom jer su u njega u određenom vremenskom trenutku bile uključene varijable resursa, angažmana i rezultata učenja.

Sudionici

U trenutku prikupljanja podataka ciljana je skupina ovog istraživanja, provedenog u akademskoj godini 2016./2017., obuhvaćala 9550 studenata (brojka ne uključuje studente prve godine) i 570 članova nastavnog osoblja s pet strukovnih učilišta u Keniji. Iz spomenutog uzorka odabrano je 696 sudionika istraživanja, što se smatra reprezentativnom brojkom, mjereno Slovinovom formulom za izračunavanje uzorka: $n = N / \{1 + N e^2\}$ (Wanjala i Malechwani, 2016). Samo 552 od ukupno 696 podijeljenih upitnika (stopa odaziva od 79%) ocijenjeno je potpunima i validnima za analizu. Dobivena brojka uvelike nadmašuje minimum (300) dovoljan za provođenje istraživanja (Field, 2005). Većinu uzorka (68,8%) čine muški sudionici (njih 380). Nešto više od jedne trećine sudionika bavi se inženjerstvom (199; 36%), a nešto manji broj primijenjenom znanosti (121; 22%). 83 sudionika bave se umjetnošću i humanističkim znanostima (15%); njih 77 bavi se ekonomijom (14%), a 72 sudionika bave se društvenim znanostima (13%).

Postupci

Najprije smo tražili dopuštenje za prikupljanje podataka od Nacionalnog odbora za znanost, tehnologiju i inovacije Kenije. Zatim smo kontaktirali administratore visokih učilišta uključenih u istraživanje kako bismo dogovorili istraživačke posjete. Potom smo uzorak podijelili na pet slojeva (pet visokih učilišta). Podatci o broju upisanih studenata i zaposlenih nastavnika na svakom učilištu dobiveni su iz odgovarajućih matičnih knjiga. Primjenom računalne aplikacije Research Randomizer došli smo do nasumičnih brojeva za svaki sloj istraživanja (Bellhouse i Kulperger, 1991). Brojevi su potom identificirani i povezani s odgovarajućim studentima i članovima nastavnog osoblja. Upitnici su podijeljeni studentima i članovima nastavnog osoblja koji su ih ispunjavali na dobrovoljnoj bazi. Nadalje, upitnici su popraćeni kratkim pismom koje sadrži molbu za sudjelovanje i objašnjenje svrhe istraživanja. Pismom se sudionicima jamči povjerljivost njihovih odgovora.

Instrumentarij istraživanja

Sa svrhom prikupljanja podataka dizajnirana su dva seta strukturiranih upitnika, naslovljenih *2017 College Life Survey*: jedan za studente, drugi za članove nastavnog osoblja. Nakon znatne modifikacije operativni su elementi dobiveni iz Nacionalnog istraživanja angažiranosti studenata (skrać. NIAS). Instrumentarij spomenutog istraživanja mjeri stupanj do kojeg studenti sudjeluju u obrazovnim praksama koje su prijašnja istraživanja povezala s visokovrednovanim rezultatima visokih učilišta (Kuh, 2003). Ukupna brojka od 101 pitanja organizirana je u pet podskupina: resursi (20 jedinica), angažiranost vršnjaka (21 jedinica), angažiranost nastavnog osoblja (17 jedinica), društvena i kulturna angažiranost (26 jedinica), demografski podatci (4 jedinice) i rezultati učenja (13 jedinica). Za svaku od jedinica koristila se Likertova skala od četiri stupnja kao optimalan broj alternativa (Lee i Paek, 2014), kako bi se umanjili učinci neparnih rezultata (Revilla, Saris, i Krosnick, 2013).

Pouzdanost

Psihometrijske karakteristike instrumentarija Nacionalnog istraživanja angažiranosti studenata jasno su utvrđene i izbalansirane (Kuh, 2003). Nadalje, rezultati izvještaja NIAS-a iz godine u godinu su stabilni, djelujući time kao snažan pokazatelj pouzdanih mjera (Rugutt i Chemosit, 2005). Rezultati ovdje predstavljenog istraživanja zavisne su varijable, dok resursi i angažiranost predstavljaju prediktorske varijable koje utječu na rezultate učenja studenata. Procijenili smo unutarnju konzistentnost primjenjujući procedure analize pouzdanosti SPSS-a na zadan set konstruiranih varijabli (Field, 2005). Dobivene vrijednosti Cronbachove alfe za četiri konstrukta, točnije resurse (0,926), interakciju s vršnjacima (0,953), nastavno osoblje (0,965) i društveno-kulturne elemente (0,984) premašile su prag od 0,70 za konzistentne i pouzdane ljestvice (Peterson, 1994).

Valjanost

Metoda glavne komponente eksplorativne faktorske analize koristila se kao osnovni preduvjet provjeravanja valjanosti konstrukta za jednodimenzionalnost mjere. Sve varijable za koje koeficijent iznosi manje od 0,45 eliminirane su, a vrijednosti koje značajno odstupaju od prosjeka i čija devijacija iznosi +/-2 uklonjene su uz pomoć odgovarajuće dijagnostike. Time je broj parametara koje treba uzeti u obzir smanjen sa 101 na 73. Utvrđen je omjer veličine uzorka prema parametrima u iznosu od 8:1, što je između vrijednosti od 20:1 i 5:1 za stabilne procjene (Kline, 2005). Primijenjen je Varimax Rotation čime su dobiveni iznosi faktorskih opterećenja varijabli iznosa u rasponu od 0,500 do 0,818. Ukupna varijanca objašnjenja s pomoću četiri izdvojena faktora iznosila je 91,419% (resursi: 29,437%; vršnjaci: 24,876%; članovi nastavnog osoblja: 21,426%; društveno-kulturna komponenta: 15,679%). Rezultati testa Kaiser-Meyer Olkin podržavaju prihvatljivost uzorka i primjerenost prikupljenih podataka za unifaktorsko određivanje (0,978 na razini značajnosti od 0,000). Na kraju, sva četiri konstrukta u značajnoj su i pozitivnoj korelaciji s rezultatima učenja studenata, čime se uspostavlja valjanost vezana uz kriterije.

Analiza podataka

Prikupljeni podatci analizirani su s pomoću programa SPSS 21.0 i Amos 21.0. Provedeno je niz analiza, uključujući opisnu statistiku, analizu glavnih komponenta (*Principal Components Analysis*, skrać. PCA) kojom su identificirane empirijski dobivene dimenzije faktora istraživanja, analizu pouzdanosti za svaku od mjernih dimenzija, konfirmatornu faktorsku analizu (*Confirmatory Factor Analysis*, skrać. CFA) kojom su operacionalizirane latentne varijable, procjenu prikladnosti statističkog modela i statistički model utemeljen na statističkim jednadžbama (*Structural Equation Modelling*, skrać. SEM). S obzirom na njegovu sposobnost utvrđivanja izravnih i neizravnih utjecaja svake od varijabli obuhvaćenih modelom za varijablu rezultata SEM je poslužio kao primarna metoda analize podataka. Matrice korelacija i kovarijanci dobivene programom SPSS koristile su se u programu Amos kako bi se razvio odgovarajući statistički model uz pomoć generalizirane procjene utemeljene na kriteriju najmanje kvadratne vrijednosti (Kline, 2005). U kontekstu ovog istraživanja obrazovni se sustav percipira kao produktivan, pri čemu resursi i angažiranost čine unose, a rezultati učenja studenata predstavljaju ukupne rezultate. U tom je smislu ocijenjeno da regresijski model u najvećoj mjeri odgovara ovom kontekstu.

Dva su tipa funkcija obrazovne produkcije: s dodanom vrijednošću za longitudinalne podatke i linearna za podatke iz pojedinih razdoblja (Mostafa, 2010). Budući da su podatci prikupljeni samo u jednom razdoblju, procijenjeno je da je (kao što je vidljivo iz prve jednadžbe) linearni model prikladniji za taj set podataka. Potom je primijenjen kauzalni pristup sa svrhom analize posredničkih učinaka (Baron i Kenny, 1986). Taj pristup uključuje tri tipa regresijskih jednadžbi vezanih uz neovisne, posredničke i ovisne varijable (vidi jednadžbe 2, 3 i 4). Rezultati tih jednadžbi koristili su se za procjenu sljedećih uvjeta posredničkog učinka: (1) resursi moraju biti značajno vezani uz rezultate učenja; (2) resursi moraju biti značajno vezani uz stupanj angažiranosti; (3) angažiranost treba biti značajno manje vezana uz rezultate učenja; (4) resursi bi trebali biti neizravno vezani uz rezultate učenja putem angažiranosti. Zadovoljenje svih uvjeta nudi dokaze potpune medijacije; nasuprot tome, zadovoljenje samo prva tri uvjeta upućuje na djelomičnu medijaciju.

Rezultati

Opisna statistika

Sve konstruirane varijable imale su ukupno 14 parametara za procjenu, s prosječnom vrijednošću koja uvelike nadmašuje 2,0, s obzirom na četverodijelnu Likertovu skalu. Kod konstruiranih je varijabli zabilježeno malo odstupanje od prosjeka, što upućuje na homogene rezultate. Pažljivijim razmatranjem varijabli za pojedine konstrukte došli smo do sljedećih opažanja: za latentnu varijablu resursa srednje vrijednosti odgovora nastavnčkog osoblja i studenata u rasponu su od maksimalnih 3,10, odnosno 3,55 („Zadovoljan sam resursima koje nudi ova obrazovna institucija“), do minimalnih 2,44 za nastavničko osoblje („nedovoljno izvannastavnih aktivnosti“), odnosno 2,16 za

studente („loši hosteli“). Međutim, na području razvoja raspoloživih resursa zabilježen je značajan napredak: primjerice, potkraj 2016. godine prosjek korištenja knjižnica od studenata bio je 73,24%, što se pripisuje povećanju knjižničnih resursa uvođenjem elektroničkih knjiga i 4G mreža koje nude bolju i bržu povezanost od starih 3G mreža.

Za latentnu varijablu angažiranosti prosječne vrijednosti za odgovore koje su ponudili članovi nastavnog osoblja variraju od maksimalnih 3,53 („koristi se primjerima i ilustracijama“) do minimalnih 2,56 („nudi nedovoljno dopunske nastave“); nasuprot tome, vrijednosti za odgovore koje su ponudili studenti variraju od maksimalnih 2,93 („kolegij je važan za buduću karijeru“) do minimalnih 2,06 („interakcija s nastavnicima izvan učionice“). Za latentnu varijablu interakcije s vršnjacima vrijednosti odgovora koje su ponudili članovi nastavnog osoblja variraju od maksimalne vrijednosti od 3,01 („studenti uče zajedno“) do minimalne vrijednosti od 2,18 („zanimanje za javne službe“); nasuprot tome, vrijednosti odgovora koje su ponudili studenti kreću se od maksimalnih 3,26 („praćenje nastave“) do minimalnih 2,53 („opterećeni nastavnim gradivom“). Za latentnu varijablu društveno-kulturne angažiranosti, vrijednosti odgovora koje su ponudili članovi nastavnog osoblja kreću se od maksimalnih 3,50 („toleriraju studente različitih vjeroispovijesti“) do minimalnih 2,28 („oklijevaju pridružiti se društvenim skupinama“); vrijednosti za odgovore koje su ponudili studenti kreću se od maksimalnih 3,03 („osjećam se djelom zajednice visokog učilišta“) do minimalnih 2,19 („prisustvujem natjecanjima među visokim učilištima“).

Jednosmjerni ANOVA test primijenjen je na demografske faktore sudionika, kao što su spol, stanarski status, kvalificiranost i područje specijalizacije, nasuprot konstruiranim varijablama (resursi i angažiranost). Primjenom posthoc i testa homogenosti utvrđeno je da vrijednost nijednog od demografskih faktora – spol (0,432; 0,103), stanarski status studenata (0,331; 0,203), kvalificiranost članova nastavnog osoblja (0,349; 0,215) i područje specijalizacije studenata (0,065; 0,051) – nije statistički značajna (p vrijednost $> 0,05$). Ti se faktori ne smatraju odlučujućim budući da je homogenost pretpostavke varijance zadovoljena. Pozitivne korelacije utvrđene su za međupoveznice latentnih varijabli, koje su k tome i statistički značajne: resursi za rezultate učenja (0,829; 0,000), resursi za angažiranost studenata (0,942; 0,000) i studentska angažiranost s obzirom na rezultate učenja (0,921; 0,000).

Faktorska analiza u užem smislu

Slika 2 prikazuje model faktorske analize u užem smislu za neopažene varijable, pri čemu resursi i angažiranost predstavljaju zajedničke faktore. Koeficijenti koji vode od zajedničkih faktora do opaženih varijabli jesu faktorska opterećenja. Cjelokupni model odgovara podatcima budući da χ^2 (552) proizvodi vrijednost od 35,16, čija je procjena (s 8 stupnjeva slobode) rezultirala odgovarajućom p vrijednošću od 0,156. Nadalje, sljedeće su vrijednosti ostvarene unutar prihvatljivog raspona: GFI=0,872, CFI=0,943, NFI=0,942, RMR=0,019 i RMSE=0,028 (Kline, 2005). Regresija je pozitivna kao i korelacija između resursa i angažiranosti. Višestruke kvadratne korelacije prilično su

visoke; primjerice, koeficijenti za angažiranost nastavnog osoblja i društveno-kulturnu angažiranosti iznosili su 0,98. To znači da angažiranost nastavnog osoblja i društveno-kulturna angažiranost čine 98% varijance, a jedinstvene varijable e5 i e6 čine svega 2%.

Slika 2

Izravni i neizravni učinci

Razvili smo statistički model utemeljen na strukturnim jednadžbama kako bismo analizirali izravne i neizravne učinke resursa, angažiranosti i rezultata učenja, oslanjajući se na spoznaje predstavljene u postojećoj literaturi. Pretpostavili smo da resursi izravno utječu na rezultate učenja studenata, no u prisutnosti angažiranosti resursi imaju neizravan utjecaj na rezultate učenja. Slika 3 pokazuje da je iznos koeficijenta regresije za resurse, koji ima značajan utjecaj na postignuće (p vrijednost $< 0,001$), 0,62.

Slika 3

Kad je modelu pridodana posrednička varijabla (angažiranost studenata), ustanovljeno je da je koeficijent regresije resursa znatno smanjen (s 0,62 na 0,01) te da kao takav više nije značajan (p vrijednost = 0,835). Međutim, kao što pokazuje slika 4, postoji statistički značajan izravan utjecaj resursa na angažiranost (0,85; $p < 0,001$) i angažiranosti na postignuća (0,71; $p < 0,001$).

Slika 4

Čini se jasnim da angažiranost predstavlja posredničku varijablu u odnosu između resursa i rezultata učenja studenata. Taj tip medijacije nazivamo potpunom medijacijom budući da izravan utjecaj resursa na rezultate učenja gubi na važnosti nakon što se u model uvede angažiranost; naprotiv, važan je neizravan utjecaj. Stoga odbacujemo hipotezu o izravnom utjecaju resursa na rezultate učenja i prihvaćamo hipotezu o neizravnom utjecaju resursa na rezultate učenja uz posredovanje angažiranosti (v. Tablicu 1). To znači da ovdje predstavljenom istraživanju odgovara jednadžba 4.

Tablica 1

Rasprava

Ovaj rad donosi pažljivu i sustavnu analizu utjecaja resursa i angažiranosti na rezultate učenja studenata na visokim učilištima u priobalnom djelu Kenije. U istraživanju su primijenjeni resursi kao nezavisne varijable, angažiranost kao posrednička varijabla i rezultati učenja kao zavisna varijabla. Iako su mnoga prijašnja istraživanja pokazala statistički značajne i pozitivne korelacije između demografskih faktora kao što su stanarski status (Astin, 1999; Pascarella, Bohr, Nora, Zusman, Inman, i Desler, 1994), spol i kvalificiranost (Adeyemi i Adeyemi, 2014; Nurhadi, Zahro, i Lyau, 2017) s jedne, a akademskog uspjeha s druge strane, ovdje predstavljenim istraživanjem utvrđeno je da spol, stanarski status, kvalificiranost nastavnog osoblja i područje specijalizacije studenata nisu doveli do značajnijih razlika među skupinama. Ti faktori, stoga, nisu smatrani odlučujućima.

Ovdje predstavljene spoznaje o spolu i kvalificiranosti nastavnog osoblja nisu jedinstvene (Kimani i sur., 2013). Rivkin i suradnici (2005) istražili su nastavničke faktore koji utječu na akademska postignuća studenata i otkrili da spol i kvalifikacija nastavnika nisu statistički značajni za tumačenje akademskog uspjeha studenata. Rezultati nastavničke kvalificiranosti stoga sugeriraju da dodatne kvalifikacije mimo fakultetske diplome ne jamče automatsko poboljšanje nastavničkih sposobnosti. Štoviše, velik dio nastavnog osoblja zaposlenog na visokim učilištima u Keniji koji su stekli doktorat prihvaćaju poslove na sveučilištima, a preostali zaposleni nastavnici nerijetko su u potrazi za drugim poslovima. Kad je riječ o stanarskom statusu studenata, Astin (1999) potvrđuje akademsku angažiranost studenata zaposlenih na pola radnog vremena. Čak i studenti koji stanuju izvan kampusa često imaju akademsku podršku od roditelja koji nerijetko žele razgovarati o njihovu napretku pa kod kuće nude obrazovne poticaje.

Nakon kontrole demografskih faktora sudionika testirane su polazne hipoteze. Rezultati testiranja otkrili su sljedeće: (1) u slučajevima kada angažiranost izostaje, resursi su statistički značajni te stoje u pozitivnoj korelaciji s rezultatima učenja (0,829**), a koeficijent regresije resursa iznosi 0,62, sa značajnim utjecajem na rezultate učenja (p vrijednost < 0,001); (2) uvođenjem angažiranosti kao medijatorske varijable u model zabilježeno je smanjenje koeficijenta regresije s 0,62 na 0,01, čiji učinak prestaje biti značajan (p vrijednost = 0,835). *Hipoteza 1* se stoga odbacuje. Međutim, zabilježena je i statistički značajna i iznimno pozitivna korelacija između resursa i angažiranosti (0,942**), kao i angažiranosti i rezultata učenja (0,921**). Nadalje, koeficijent regresije za angažiranost, koji bitno utječe na rezultate učenja (p vrijednost < 0,001), iznosi 0,71, To znači da su utjecaji angažiranosti stvarni te da možemo prihvatiti hipotezu 2.

Ostavljajući po strani testiranje hipoteza, okrećemo se srednjim vrijednostima odgovora. Većina sudionika (članovi nastavnog osoblja i studenti) dala je veće ocjene angažiranosti studenata u odnosu na resurse učilišta (kombinirane srednje vrijednosti pojedinih elemenata: 2,64, odnosno 2,85). Rezultati otkrivaju da su stavovi članova nastavnog osoblja i studenata prema različitim aspektima obrazovanja koji bi mogli unaprijediti rezultate učenja tijesno vezani uz angažiranost studenata. Čak i u slučajevima kada velik dio nastavnika i studenata izražava zadovoljstvo raspoloživim resursima visokih učilišta (srednja vrijednost od 3,55, odnosno 3,10), samo 6 od ukupno 14 elemenata upitnika obuhvaćenih latentnom varijablom resursa ostvaruje srednju vrijednost veću od 2,5, a svi elementi latentne varijable (uz izuzetak dvaju elemenata) studentske angažiranosti ostvaruju srednju vrijednost višu od 2,5.

Ti rezultati otkrivaju središnje kontroverze koje okružuju velik dio istraživanja rezultata učenja. Iako brojna postojeća istraživanja povezuju akademski uspjeh s resursima institucija visokog obrazovanja (Greenwald i Hedges, 1996; Onyara, 2013), ostaje još mnogo toga što tek treba utvrditi. U utjecajnoj seriji radova Hanushek (1998) zaključuje da ne postoji snažna ili konzistentna veza između resursa i studentskih rezultata. Razlog tomu možda leži u činjenici da su resursi često nedovoljno razvijeni ili nedovoljno iskorišteni. Dakle, samo izlaganje studenata resursima može, ali i ne mora

dovesti do akademskog uspjeha. Međutim, da bi pojedini resursi postigli očekivane rezultate, nastavnici i studenti moraju uložiti određeni napor usmjeren na ostvarivanje željenih rezultata učenja. Spomenuti je napor moguć putem interakcije s vršnjacima i članovima nastavnog osoblja, kao i putem društveno-kulturne angažiranosti.

Nema sumnje da angažiranost ostvaruje golem utjecaj na akademska postignuća studenata (Astin, 1999; Pascarella i sur., 1994; Tinto, 1987). Pojednostavljeno rečeni, što više studenti ulažu u vlastite odnose s vršnjacima, predavačima i društveno-kulturnim kontekstom (pod uvjetom da su drugi elementi nepromjenjivi), to je veća vjerojatnost njihova uspjeha. Studenti koji se angažiraju ostvaruju veće dobiti od učenja (Siming, Gao, i Xu, 2015). Predstavljene rezultati ukazuju na nužnost da administratori i predavači prepoznaju činjenicu da institucionalna pravila i prakse mogu utjecati na način na koji studenti provode vrijeme posvećeno akademskim aktivnostima s ciljem promicanja njihove angažiranosti. Ukratko, teorija angažiranosti potiče obrazovne djelatnike da se manje usredotočuju na ono što čine oni sami, a više na ono što čine njihovi studenti, jer time promoviraju rezultate učenja studenata. Sve osoblje visokih učilišta bi stoga trebalo procijeniti vlastite aktivnosti preko prizme uspjeha u poticanju studenata da se više angažiraju u vlastitom visokoškolskom obrazovanju.

Imajući na umu ta otkrića, visoka bi učilišta treba uvesti aktivnosti koje promoviraju međuvršnjačku interakciju (poput djelovanja u javnim službama) u razredne zadatke, promicati aktivno učenje u skupinama, društvenu i kulturnu interakciju, kao i međuvršnjačke odnose s ciljem angažiranja studenata. Prakse akademske socijalizacije kao što su rasprave o akademskim temama i promicanje obrazovnih ciljeva također su učinkovite u promoviranju ciljeva učenja (Astin, 1999). S obzirom na njihovo središnje mjesto u procesu transformacije znanja (što je, primjerice, slučaj u mnogim vodećim visokim učilištima humanističke orijentacije), nastavnici bi trebali preuzeti vodeću ulogu u promoviranju aktivnog i suradničkog učenja. To je vidljivo, primjerice, u Sjedinjenim Američkim Državama gdje obrazovne institucije kao što je Williams College zapošljavaju kvalitetno nastavno osoblje, a omjer broja studenata i nastavnika je čak 7:1 (U.S. News & World Report, 2017). Nadalje, važno je identificirati studente koji se ne angažiraju i uključiti ih u obrazovno smislene aktivnosti kao što je zahtjevan rad na nastavi. Time osiguravamo da će takvi studenti češće dogovarati konzultacije s nastavnicima, čime se promovira angažiranost nastavnog osoblja. Na sličan način nastavnici mogu stvoriti prilike za vršnjačko ocjenjivanje i promovirati vršnjačko učenje/poučavanje tražeći od studenata da surađuju s drugima na zadacima i projektima izvan učionice. Osim toga, visoka bi učilišta trebala uključiti roditelje u akademske živote njihove djece, te ih na taj način potaknuti na oprez.

Na kraju, administratori zaduženi za studentske poslove trebali bi u obrazovne programe uključiti savjetovanje i tako potaknuti razvoj karijere. Mnogi studenti koji pohađaju visoka učilišta nisu uspješni u realizaciji vlastitih ciljeva vezanih uz karijere. Drugi, pak, nisu u stanju nositi se s akademskih očekivanjima pa stoga izražavaju apatiju prema učenju, koja dovodi do slabih rezultata. U institucijama kojima je cilj

maksimalno angažirati studente savjetnici vjerojatno imaju mnogo važniju ulogu u djelovanju tih institucija. Uz pomoć drugih zaposlenika savjetnici mogu identificirati aktivnosti u koje je pojedini student trenutno uključen. To im može pomoći da utvrde jesu li poteškoće s kojima se susreće taj student posljedica manjka motivacije ili loših radnih navika. Nakon što se to utvrdi, moguće je pronaći odgovarajuće rješenje. Osim toga, uključivanje studenata u proces donošenja odluka koje utječu na njih putem studentskih tijela ili otvorenih foruma na kojima mogu razgovarati o problemima s kojima se susreću pomaže u premošćivanju jaza između studenata i administratora, što pridonosi stvaranju skladnog života na visokom učilištu.

Nedostatci i implikacije za buduća istraživanja

Usprkos činjenici da ovdje predstavljeno istraživanje nudi vrijedan doprinos postojećoj literaturi, neka područja zahtijevaju dodatna istraživanja. Kao prvo, u obzir valja uzeti visoka učilišta u drugim dijelovima zemlje te provesti komparativnu analizu koja bi obuhvatila i druge zemlje svijeta. Iako učilišta obuhvaćena ovim istraživanjem okupljaju studente i nastavnike iz svih dijelova Kenije, utjecaji resursa i angažmana mogli bi varirati ovisno o geografskoj lokaciji. Kao drugo, daljnja bi istraživanja trebala razmotriti longitudinalni proces uspješnosti studenata odražen u longitudinalnim, a ne samo poprečnim podacima. Za to je nužan detaljan nastavak istraživanja koji bi obuhvatio pojedince u raznim vrstama institucija visokog obrazovanja. To bi, pak, omogućilo svrhovitu komparativnu analizu institucionalnog utjecaja na ponašanje i uspjeh studenata. Nadalje, analiza bi trebala slijediti longitudinalnu regresiju poput logit-analize jednadžbi prema odabranim kategorijama kao sredstvo rješavanja problema provođenja regresivne analize u slučajevima kada postoje kvalitativne zavisne varijable.

Kao treće, ovo istraživanje bavi se percepcijom resursa od nastavnika i studenata, kao i utjecajem njihove primjene tih resursa na rezultate učenja. Stoga nije poznato u kolikoj mjeri ta percepcija odražava stvarne uvjete. Primjerice, moguće su značajne varijacije među pojedincima koje otvaraju mogućnost varijabli utemeljenih na vjeroispovijesti, kulturi ili političkoj orijentaciji. Kako bi se unaprijedili postojeći uvjeti, daljnja bi istraživanja u obzir trebala uzeti mogućnost prikupljanja podataka o stvarnim uvjetima resursa visokih učilišta i studentske angažiranosti.

Na kraju, budući da je ovdje predstavljeno istraživanje isključivo usmjereno na resurse visokih učilišta i angažiranost studenata u vezi s rezultatima njihova učenja, pri čemu su demografski faktori bili kontrolirani, predlažemo uvođenje moderacijske varijable u model. Našim istraživanjem obuhvaćena su četiri demografska faktora za koje je utvrđeno da nemaju utjecaja na rezultate učenja. Budući istraživači mogu uključiti više faktora kao što su iskustvo nastavnika, studentski status, ekonomski status studenata i obrazovni stupanj roditelja studenata, koji bi mogli utjecati na rezultate učenja studenata.

Implikacije za više obrazovanje i praksu

Rezultati ovdje predstavljenog istraživanja nude nekoliko mogućih implikacija za praktičare. Najprije je od ključne važnosti prepoznati doprinos resursa visokih učilišta i

angažiranosti studenata na rezultate učenja jer su dio tekućih profesionalnih rasprava u području obrazovanja. Zatim, u nastojanju da pomognu studentima koji imaju poteškoće u izvršavanju akademskih obaveza, odgovorne bi osobe vlastite odluke trebale temeljiti na dostupnosti resursa učilišta i kvaliteti interakcije studenata na učilištu. Rezultati ovog istraživanja sugeriraju da je angažiranost studenata savršen posrednik između resursa i rezultata učenja, što upućuje na zaključak da bi resurse trebalo vrednovati prema tome na koji način povećavaju stupanj studentske angažiranosti. Stoga bi u slučaju studenata koji su ostvarili slabe rezultate nastavnici i administratori trebali istražiti kvalitetu interakcije studenata s nastavnicima, vršnjacima i društveno-kulturnim kontekstom, te utvrditi u kojoj se mjeri ti studenti koriste resursima učilišta. Nadalje, postoji potreba za poticanjem razvoja svijesti učilišta i sveučilišta o elementima koji okružuju studentsku angažiranost kako bi se u potpunosti uključili u stvaranje obrazovnog iskustva koje unapređuje razvoj prediktora uspjeha. Za neke od njih ovo je istraživanje pokazalo da su izravno vezani uz rezultate učenja. Ovaj bi pristup mogao dovesti do poboljšanja iskustva visokoškolskog obrazovanja koje bi, pak, moglo potaknuti akademsku uspješnost među studentima.

Zaključak

Prevelik dio istraživanja rezultata učenja usmjeren je na događaje koji su izvanjski samom visokom učilištu pa kao takvi na njega nemaju izravan utjecaj. Iako informativna, takva istraživanja ne nude podlogu za razumne smjernice i prakse. Primičući se identifikaciji mogućeg modela institucionalnog djelovanja, ova studija oslanja se na teorije i postojeća istraživanja kako bi razvila model utemeljen na dvama uvjetima (resursi i angažiranost) koji su pod kontrolom institucija uz koje su vezani rezultati djelovanja studenata. Rezultati pokazuju da će u slučajevima kada se resursi učilišta mobiliziraju na način koji učenje čini zanimljivim i poticajnim učenici ostvariti uspjeh. Nadalje, angažirani studenti dosežu veći stupanj osobnog i profesionalnog razvoja. Naše istraživanje stoga preporučuje učinkovitu primjenu ovog modela na visokim učilištima gdje bi mogao služiti kao vodič za primjenu smjernica visokog obrazovanja. Sa stajališta obrazovnih djelatnika resurse bi valjalo ocijeniti uzimajući u obzir stupanj do kojega uvećavaju angažiranost. Točnije, nastavnici, koji su u samom središtu preobrazbe znanja, trebali bi biti u prvim redovima promicanja angažiranosti studenata.

Napomena

Ovo je istraživanje nastalo uz potporu Nacionalnog ureda za obrazovne znanosti i planiranje u Kini, u sklopu potpore BIA170190. Autori izjavljuju da ne postoji sukob interesa.