Journal of Human Resource and Leadership (JHRL)

EFFECTIVE TIME MANAGEMENT PRACTICES AMONG COLLEGES OF EDUCATION STUDENTS

Bernice Yawa Tsitsia, Dickson Cheney-Afenu, Samuel Kwasi Kabbah, Antoinette Sena Attigah and Bimpeh George Kwamla



EFFECTIVE TIME MANAGEMENT PRACTICES AMONG COLLEGES OF EDUCATION STUDENTS

^{1*}Bernice Yawa Tsitsia Department of Mathematics/ICT, Peki College of Education, Ghana. Corresponding Author: Email: <u>yawabern@gmail.com</u>

² Dickson Cheney-Afenu Registry Department – Peki College of Education, Ghana

³Samuel Kwasi Kabbah Department of Mathematics/ICT, Peki College of Education, Ghana.

⁴Antoinette Sena Attigah Department of Science, Peki College of Education, Ghana.

⁵George Kwamla Bimpeh Department of Education, Peki College of Education, Ghana.

Abstract

Purpose: The purpose of this study was to examine the extent of effective time management practices of the teacher-trainees in the Colleges of Education in Ghana.

Methodology: The population of the study comprised teacher-trainees (students) of the Public Colleges of Education in the Volta Region of Ghana. Two Colleges were chosen in the region based on convenience sampling technique. In all, a total of 336 participants completed the study survey questionnaire. Statistical data analysis was carried out using the Jamovi Statistical Data Analysis (JSDA) tool and the Microsoft Excel Application package. The instrument was pilottested on thirty students. The Cronbach's Alpha (α) reliability analysis measures were computed. The returned α values obtained on the constructs include 0.95, 0.97 and 0.98, and with the overall α as 0.91.

Findings: The findings revealed that the existence of time management strategies to check students' time consciousness is of low rate in the Colleges. The respondents' average rate of 60.5% totally disagreed on the items tested revealing strong indications of the Colleges low considerations of the awareness creation on effective time management strategies. On the students' level of time management practices in the Colleges, the findings revealed a total frequency of about 52.8%, hardly or never adhere to time management practices as individuals. With this, the overall mean value of approximately 1.67 was calculated indicating the trainees' low level of attainment on effective time management practices.

Unique Contribution to Theory, Practice and Policy This study recommends that the authorities of the Colleges of Education should develop successful time management strategies in the Colleges to assist teacher-trainees in developing good time management habits.

Keywords: time management, teacher-trainees, colleges of education



1.0 INTRODUCTION

Britton, and Tesser (1991, p. 405) by assertion, uphold that "students' time is a limited resource. Like other limited resources, time can be more or less effectively managed." Time is considered to be one of the most valuable commodities in life and should be used positively because of its real wealth (Basri, Wael & Alghaswyneh, Odai, 2015). Alwan, and Ehmied (2009), in their study maintained that, time if used wisely, is seen as a chance; it helps in accomplishing our goals, and leads to failure if wasted. Pehlivan, (2013) argued that focusing on efficient time management is the secret to success in life.

The essence of time management in connection with academic achievements has enacted so many scholarly studies in the field of students' time management over the years. MacCann, Fogarty, and Roberts, (2012) gave a conceptual definition of time management as a collection of patterns or learning practices that can be learned through enhanced awareness, preparation or intentional practice. Time management has been described as "behaviours" aimed at achieving an efficient use of time while conducting certain goal-directed activities (Claessens, Van Eerde, Rutte & Roe, (2007). Time management is also personified as self-management with an explicit emphasis on time to determine what to do; how much time to allocate to tasks; how to conduct activities more effectively; and when the time is right for specific activities (Mercanlioglu, 2010).

In connection with the relationship of time management and academic achievement, there have been mixed findings recorded by literature. While some studies revealed significant relationships between students' time management and the academic performances, on the other hand, some recorded little or no significant relationship between the two variables. The study of Ghiasv and, Naderi, Tafreshi, Ahmadi, and Hosseini, (2017) entitled "Relationship between time management skills and anxiety and academic motivation of nursing students in Tehran" showed the outcome of a significant positive association between the time management scores of students and academic motivation scale scores (r=0.279, p< 0.001). The study conducted by Gayef, Tapan, and Sur, (2017) however, showed the p value to be greater than 0.05 (p> 0.05) indicating no substantial difference between the mean scores and academic performance of students' time management subscales according to their working status, grade, programme, mother and father's educational status as investigated. Similarly, the findings of Basri (2015) also revealed, in terms of planning and coordination, there is no statistically relevant association between the elements of time management of students and their academic performance with low levels of time utilization. Also, the findings of Swart, Lombard and Jager (2010), on the "Relationship between time management skills and the academic achievement of African engineering students", showed no statistically significant association between time management abilities and the academic performances of the students.

Studies also revealed the importance of time management on academic achievements. The study of Demirtas & Özer, (2007), discovered that students' who can manage the available time at their disposal very well have very high academic achievements. Dipboye and Peek (1990) in their study saw students who perceived time management reported substantially higher performance assessments, higher work and life satisfaction, less role uncertainty, less role overload, and less job-induced and somatic tensions. The study of Britton, and Tesser (1991, p. 405), tested the hypothesis that college grade point average would be predicted by time-management practices.



Based on regression analysis, the findings had it that time-management practices may influence students' achievement.

It is empirically evident that management of time is one of the greatest determinants of students' academic success and beyond. García-Ros, Pérez-González, and Hinojosa (2004) in their study assert that students' concerns mainly focus on insufficient time in the various academic fields to carry out all the tasks assigned to them. Time indeed a free given commodity when managed well yield desired results. Students' time management is very keen in academic progressions. Brigitte, Claessens, Eerde, and Rutte, (2005) were of the view that it is necessary every student has the ability to manage time, which involves setting goals and expectations, and using mechanisms for time management. This they assert can only be attained through self-motivation, deed, skill and external motivation.

This current study focuses on the Colleges of Education Students' (teacher-trainees, pre-service teachers, trainees) effective time management practices. The teacher-trainees are expected to undergo series of classroom and practical activities to accomplish per semester courses. Coupling classroom, field, social engagements as well as assessments on courses actually demand effective time management practices on the part of these students. More often than not, the students use the common slogan "we don't have enough time", yes indeed time is never sufficient, that is why it is necessary to exhibit effective time management practices to accomplish a set goal. Basri (2015, p. 4) stated "time is regarded as an opportunity, if used wisely; it enables us of achieving our goals." Literature reveals series of studies on students' time management practices and impacts on academic performances in the various educational sectors. However, such studies are limited in the realm of Ghanaian Colleges of Education. This study explains in an effective and efficient way the importance of time management to students' academic achievement and other life activities. It is anticipated that the findings and recommendations of the study would help to increase the students' understanding of the concept of time and its management, and establish how much it matters to avoid waste of time as well as deepening the use of time productively.

1.1 Purpose

This study seeks to examine the extent of effective time management practices of teachertrainees in the Colleges of Education. Specifically the study sought to:

- 1. Examine the existence of time management strategies in the Colleges of Education.
- 2. Examine level of time management practices among the teacher-trainees in the Colleges of Education.
- 3. Examine teacher-trainees' perceptions on factors affecting effective time management practices in the Colleges.

2.0 METHODOLOGY

This study is quantitative in nature and a descriptive survey design approach was used. As indicated by Creswell (2009, p.4) quantitative research could be looked at as "the means for testing objective theories by examining the relationship among variables where the variables in turn can be measured using instruments to produce numbered data that can be analyzed using statistical procedures".



Population and Sample

The population of the study comprised students of the Public Colleges of Education in the Volta region of Ghana. Two Colleges were chosen in the region based on convenience sampling technique. Based on purposive sampling technique, the year two (level 200) students formed the study sample. The sample size calculated on 4% margin of error with population size of 600, produced the study sample size of 301 on 95% confidence level. The total of 336 participants in the survey formed the study accessible population.

Instrument

Survey questionnaire was chosen as the instrument for data collection for this study. The questionnaire was self-designed and self-administered to the intended participants. The questionnaire was structured and consisted of scale type of questions. The structure of the questionnaire was mainly based on the three variables intended to study. Two senior staff members who are experts in the field of human resource management in the Colleges of Education were engaged to check and ensure the validity of the instrument. The necessary corrections and changes of the questionnaire followed based on the directives from the experts who reviewed the instruments. The participants' informed consent was adhered to, hence there was a provision for participants to declare their willingness in participations. The questionnaire was administered in hard copies to participants. The maximum of 400 copies of the questionnaire were distributed for a 4-day interval for responding. The total of 336 responded questionnaires were successfully retrieved.

Data Collection and Analysis

Statistical data analysis was carried out using the Jamovi Statistical Data Analysis (JSDA) tool and the Microsoft Excel Application package. The instrument was pilot-tested on thirty students. This was done to test for the instruments internal consistency reliability of items. The Cronbach's Alpha (α) reliability analysis measures were computed using Jamovi Statistical Data Analysis (JSDA) tool. The returned α values obtained on the constructs include 0.95, 0.97 and 0.98, having the overall α as 0.91, show strong indications of internal consistency of the items. The reliability α within 0.70 - 0.99 is considered acceptable for a survey (Fraenkel & Wallen, 1996).

3.0 RESULTS AND DISCUSSIONS

RESULTS

This study was carried out on the purpose to examine the extent of effective time management practices among the teacher-trainees in the Colleges of Education. In effect, three construct areas were examined, these include: the existence of time management strategies, the level of time management practices among the teacher-trainees, and the teacher-trainees' perceptions on factors affecting their effective time management practices in the Colleges. Students responded to Likert questions scale items in the form 'Agree, Disagree' coded as 1 and 2 respectively for the constructs; 'the existence of time management strategies', and 'the teacher-trainees' perceptions on factors affecting effective time management practices in the Colleges', while the 3-Likert scale items of 'Regularly, Hardly (at least once in 2-weeks) and Never also coded as 1,



2 and 3 respectively was used for the construct; 'the level of time management practices among the teacher-trainees'.

Table 1: Existence of Time Management Strategies in the Colleges of Education.

Variable		Agree		Disagree	
		%	Value	%	
1. There is a robust time management policy in the institution.	147	43.8	189	56.3	
2. Time management procedures and strategies are well communicated to students.	149	44.3	187	55.7	
3. Students' time consciousness is checked through the use of effective time management checklist periodically.	120	35.7	216	64.3	
4. Periodic sensitization workshops for students on effective time management practices are organized.	88	26.2	248	73.8	
5. Students are motivated on effective time management practices periodically.	160	47.6	176	52.4	
Average Percentage		39.52		60.5	

The results in table 1 show that majority of the students with approximately 60.5% disagreed on all five construct items on the existence of time management strategies in the Colleges of Education. The frequencies of 73.8%, 64.3%, 56.3%, 55.7% and 52.4% respectively disagreed on the statements: periodic sensitization workshops for students on effective time management practices are organized, students' time consciousness is checked through the use of effective time management checklist periodically, there is a robust time management policy in the institution, time management procedures and strategies are well communicated to students, and students are motivated on effective time management practices periodically. These indicate that the existence of time management strategies to check the students' time consciousness is of low rate in the Colleges.

Table 2: Level of Time Management Practices among the Teacher-trainees in the Colleges of Education.

Variable		Regularly		Hardly		Never	
		%	Valu e	%	Val ue	%	
1. Use of time manager tool (e.g. time table, to-do list, reminder, planner etc.) in managing time.	154	45.8	148	44.0	34	10.1	
2. Organize study and leisure time easily	135	40.2	148	44.0	53	15.8	
3. Make a schedule for daily activities.	153	45.5	131	39.0	52	15.5	
4. Write a set of goals for myself for each day.	125	37.2	136	40.5	75	22.3	
5. Have a clear idea of what to accomplish weekly.	137	40.8	138	41.1	61	18.2	
6. Set and honor priorities.	130	38.7	156	46.4	50	14.9	
7. Make constructive use of time.	151	44.9	148	44.0	37	11.0	
8. Have a set of goals for the entire semester.	216	64.3	81	24.1	39	11.6	
9. Revise my notes even when a quiz/test is not pending.	212	63.1	93	27.7	31	9.2	
10. Use goal setting to determine the most important activities to do.	175	52.1	120	35.7	41	12.2	
Average percentage		47.3		38.7		14.1	



The results in table 2 show that averagely the total of 47.3% frequency of students showed regular adherence to the variables on time management practices examined. In the 10-item constructs, 64.3%, 63.1% and 52.1% respectively indicated they regularly: have a set of goals for the entire semester, revise their notes even when a quiz/test is not pending, and use goal setting to determine the most important activities to do. The respondents' total frequencies of about 54.1%, 59.8, 54.5%, 62.8%, 59.3%, 61.3%, and 55.0% respectively hardly or never: use time manager tool (e.g. time table, to-do list, reminder, planner etc.) in managing time, organize study and leisure time easily, make a schedule for daily activities, write a set of goals for myself for each day, have a clear idea of what to accomplish weekly, set and honour priorities and make constructive use of time. Averagely, the total frequency of 38.7% and 14.1% of the respondents affirmed they hardly or never practice the items of constructs on students' level of time management practices.

 Table 3: Level of Time Management Practices among the Teacher-trainees in the Colleges of Education.

Variable	Ν	Mean	Median	SD
1. Use of time manager tool (e.g. time table, to-do list,	336	1.64	2.00	0.658
reminder				
2. organize study and leisure time easily	336	1.76	2.00	0.708
3. Make a schedule for daily activities.	336	1.70	2.00	0.722
4. Write a set of goals for myself for each day.	336	1.85	2.00	0.758
5. Have a clear idea of what to accomplish weekly.	336	1.77	2.00	0.735
6. Set and honor priorities.	336	1.76	2.00	0.693
7. Make constructive use of time.	336	1.66	2.00	0.668
8. Have a set of goals for the entire semester.	336	1.47	1.00	0.695
9. Revise my notes even when a quiz/test is not pending.	336	1.46	1.00	0.659
10. Use goal setting to determine the most important	336	1.60	1.00	0.697
activities to				
Overall mean		1.67		

The table 3 shows the mean and median scores on the responses. In the 10-item constructs, the mean scores: 1.64, 1.76, 1.70, 1.85, 1.77, 1.76, 1.66 and 1.60 respectively had 2.0 median each for: use time manager tool (e.g. time table, to-do list, reminder, planner etc.) in managing time, organize study and leisure time easily, make a schedule for daily activities, write a set of goals for myself for each day, have a clear idea of what to accomplish weekly, set and honour priorities, make constructive use of time and use goal setting to determine the most important activities to do. Have a set of goals for the entire semester and revise my notes even when a quiz/test is not pending each had a mean score of 1.47 and 1.46 respectively had a median score of 1.0 each. The overall mean was calculated to be approximately 1.67, this significantly presents students low level of time management practices in the Colleges.



Table 4:	Teacher-trainees'	Perceptions	on	factors	affecting	their	effective	Time
Managem	ent Practices.							

Variable		Agree		Disagree	
		%	Value	%	
1. Socializing often keeps me from concentrating on my studies.	224	66.7	112	33.3	
2. Unable to plan for my studies.	115	34.2	221	65.8	
3. Leaving things to be done in the last minutes.	233	69.3	103	30.7	
4. Unable to set and honor priorities.	224	66.7	112	33.3	
5. Unable to organize study and leisure time.	126	37.5	210	62.5	
6. I usually prepare for examinations in the last hour.	189	56.3	147	43.8	
7. Unable to set realistic goals to determine the most important activities to do.	213	63.4	123	36.6	
Average Percentage		56.3		43.7	

The results in table 4 show total frequency of about 56.3% averagely agreed with the statements on the construct: 'Teacher-trainees' perceptions on factors affecting effective time management practices in the Colleges.' The respondents' frequencies of 66.7%, 69.3%, 66.7%, 56.3% and 63.4% agreed on the statements: socializing often keeps me from concentrating on my studies, leaving things to be done in the last minutes, unable to set and honour priorities, I usually prepare for examinations in the last hour, and unable to set realistic goals to determine the most important activities to do. However, about 65.8%, and 62.5% respectively disagreed on the statements: unable to plan for my studies, and unable to organize study and leisure time respectively.

3.1. Discussion

This study examined the existence of time management strategies in the Colleges of Education. The findings showed that the existence of time management strategies to check students' time consciousness is of low rate in the Colleges. The respondents' average rate of 60.5% (shown in table 1) totally disagreed on the items tested revealing strong indications of the Colleges low considerations of the awareness creation on effective time management strategies, this in effect was revealed in the responses of the students' level of time management practices. On the students' level of time management practices in the Colleges, the findings portrayed the total frequency of about 52.8% (table 2), hardly or never adhere to time management practices as individuals. With this, the overall mean value of approximately 1.67 was found indicating the trainees' low level of attainment on effective time management practices. This concorded to the findings of [Khanam, Sahu, Rao, Kar, & Quazi, (2017); and Alshaya, Roomi, Alzayer, Alonze & Alshaalan (2017)], both studies revealed more than 50.0% participants (students) retained moderate to low level time management score. Equally the study result of Mahasneh, Al-Zoubi, Batayeneh, Al-Sawalmeh and Mahasneh (2013) indicated that university students showed a low level of awareness about time management skills. The items break down on the teacher-trainees'



level of effective time management is as follows: 45.8% of the teacher- trainees regularly make use of time manager tool (e.g. time table, to-do list, reminder, planner etc.) in managing their time. 44.0% and 10.1% respectively hardly and never, make use of time manager tool. The results also show 40.2% respondents regularly organize study and leisure time easily, whereas 44.0%, and 15.8% respectively hardly and never organize study and leisure time easily. The findings again uncovered the frequency rates of the teacher-trainees make a schedule for daily activities regularly, hardly and never, include 45.5%, 39.0% and 15.5% respectively. The frequency of 37.2%, 40.5% and 22.3%, regularly, hardly and never, respectively write a set of goals for daily activities. In comparison, the study of Oyuga, Raburu and Peter (2016) bared 38.5% of the students prepare a daily or weekly "to do" list always while 18.2% of the students rarely prepare a daily or weekly "to do" list and 18.5% of the students never prepare a daily or weekly "to do" list.

Again the findings disclosed the percentages of about 40.8, 41.1 and 18.2, respectively indicated, they regularly, hardly and never have a clear idea of what to accomplish weekly. Whereas 38.7%, 46.4% and 14.9% respectively indicated they regularly, hardly and never set and honour priorities. These findings are almost in line with the findings of Oyuga, Raburu and Peter (2016), whose findings had 41.6%, 39.2% 10.8% and 8.4% of the students always, sometimes, rarely and never respectively do things in order of priority. In respect to constructive use of time, this study unfolded that 44.9%, 44.0% and 11.0% regularly, hardly and never, respectively make constructive use of time. These were in direct contrast with the findings of Khanam, Sahu, Rao, Kar, and Quazi, (2017) who recorded 12.7% students who always make constructive use of time. The results also show 64.3% of students regularly have a set of goals for the entire semester as 24.1% hardly do and 11.6% never have a set of goals for the entire semester. This result is again seemed to be in opposite to the findings of Khanam et al (2017) where only 25.3% students always have a set of goals for the entire quarter. However, the findings were in alignment with the findings of Oyuga et al (2016) who discovered 80.8% of the students always have a clear idea of what they want to accomplish during the coming semester. Regarding the revision of notes, 63.1% showed they regularly revise their notes even when a quiz/test is not pending whereas 27.7% hardly do so and 9.2% never revise their notes when a quiz/test is not pending. These again are in sharp contrast with the study of Khanam et al (2017) whose results showed 13.9% of the students review their class notes, even when a test is not imminent, 17.7% rarely do so and 10.2% never review their class notes.

The study also examined the teacher-trainees' perceptions on factors affecting their effective time management practices. The findings recorded as much as approximately 56% of the respondents indicating strong accession on the related factors affecting their effective time management. The respondents' frequencies of 66.7%, 69.3%, 66.7%, 56.3% and 63.4% affirmed the statements: socializing often keeps me from concentrating on my studies, leaving things to be done in the last minutes, unable to set and honour priorities, I usually prepare for examinations in the last hour, and unable to set realistic goals to determine the most important activities to do.

Conclusion

The purpose of this study was to examine the extent of effective time management practices of teacher-trainees in the Colleges of Education. Specifically the study examined the existence of time management strategies, the level of time management practices among the teacher-trainees,



and the teacher-trainees' perceptions on factors affecting their effective time management practices. The findings revealed that the existence of time management strategies to check students' time consciousness is of low rate in the Colleges. The findings also suggested that the time management practices of the teacher-trainees is extreme. The trainees' level of time management practices appeared to be well placed only on a few time management dimensions whilst for the majority, there seemed to be much scope for upturn.

Recommendations

The following are some suggestions for consideration based on the results of the study:

It is strongly suggested that the authorities of the Colleges of Education develop successful time management strategies in the Colleges to assist teacher-trainees in developing good time management habits. It is also recommended that the authorities take teacher-trainees through the development of awareness and the value of good time management activities on a regular basis.

REFERENCES

- Alshaya H. M, Roomi M. A, Alzayer M. A, Alonze S. K, Alshaalan R. F. (2017). Is time management related to better academic performance and perceived academic satisfaction among medical students? A cross-sectional survey in Saudi Arabia. Int J Adv Res. 5(1):2205-13. www.journalijar.com
- Alwan, Q. N., & Ahmid, N. R. (2009). *Time management: concepts- operations and applications. Amman, Jordan: Dar Al-Thaqafa for Publication.*
- Basri, Wael & Alghaswyneh, Odai. (2015). The Role of Time Management and its Impact on Students' academic achievement. International Research Journal of Finance and Economics.
- Brigitte, J. C., Claessens, Eerde, W. V., Rutte, C. G, Roe, R. A. (2005). A review of the time management literature. Emerald Group Publishing Limited, 36 (2), 2007.
- Britton, B. K., & Tesser, A. (1991). *Effects of time-management practices on college grades. Journal of Educational Psychology*, 83, 405–410.
- Cemaloğlu, N & Filiz, S. (2010). The Relation between Time Management Skills and Academic Achievement of Potential Teachers Educational Research Quarterly, 33 (4) 3-23
- Claessens B. J, Van Eerde W, Rutte C. G & Roe R.A (2007). A review of the time management literature Personnel Review 36(2) 255-276.
- Creswell, J. W. (2009). Research design: qualitative, quantitative, and mixed methods approaches. 3rd ed. Los Angeles: Sage.
- Demirtaş, N. & Özer, N. (2007). The relationship between the time management skills and the academical achievement of the potential teachers. Eğitimde Politika Analizleri ve Stratejik Araştırmalar Dergisi, 2, 34-47.
- Dipboye R. L. & Peek P. A. (1990). College Students' Time Management: Correlations with Academic Performance and Stress Journal of Educational Psychology Vol. 82, (4), p.760-768



- Fraenkel, J.R and Wallen, N .E., (1996). How to Design and Evaluate Research. USA: Mc. Fraw-Hill Inc
- García-Ros, R. & Pérez-González, F. & Hinojosa, E.(2004). Assessing Time Management Skills as an Important Aspect of Student Learning: The Construction and Evaluation of a Time Management Scale with Spanish High School Students 167-183. 10.1177/0143034304043684.
- Gayef, A., Tapan, B. & Sur, H., (2017). Relationship between Time Management Skills and Academic Achievement of the Students in Vocational School of Health Services Hacettepe Sağlık İdaresi Dergisi, 20(2): 247-257.
- Ghiasvand, A. M., Naderi, M., Tafreshi, M. Z., Ahmadi, F., & Hosseini, M. (2017). Relationship between time management skills and anxiety and academic motivation of nursing students in Tehran. *Electronic physician*, 9(1), 3678–3684. https://doi.org/10.19082/3678
- Khanam, N., Sahu, T., Rao, E., Kar, S., & Quazi, S. (2017). A study on university student's time management and academic achievement. *International Journal of Community Medicine* and Public Health, 4(12), 4761-4765. <u>http://dx.doi.org/10.18203/2394-6040.ijcmph20175365</u>
- MacCann, C., Fogarty, G. J. & Roberts R. D., (2012). Strategies for success in education: Time management is more important for part-time than full-time community college students. Learning and Individual Differences Journal 123-125.
- Mahasneh A.M., Al-Zoubi Z.H., Batayeneh O.T., Al-Sawalmeh A.A, Mahasneh A.M. (2013). Attitudes of University students towards time management skills. European Journal of Social Sciences. 38 (3):392-99.
- Mercanlioglu C. (2010). The relationship of time management to academic performance of master level students International Journal of Business and Management Studies 2(1) 1309-8047.
- Oyuga P.A, Raburu P., Peter J.O. (2016). Relationship between Time Management and Academic Performance among Orphaned Secondary School Students of Kenya. Int. J Applied Psychol. 6(6):171-8.
- Swart A. J., Lombard K. & Jager H. (2010). Exploring the relationship between time management skills and the academic achievement of African engineering students a case study. European Journal of Engineering Education 35(1) 79-89.