

ASSESSMENT OF FEEDBACK MECHANISM ON STUDENTS ENGAGEMENT AND STUDENTS PERFORMANCES DURING VIRTUAL CLASS IN NATIONAL OPEN UNIVERSITY OF NIGERIA

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ABSTRACT

Feedback is a crucial element of the scaffolding process for learning. Feedback offers valuable insights into learners' progress in attaining learning objectives and enhancing their self-regulatory abilities. Feedback assumes heightened importance in online courses due to the geographical and physical separation between instructors and students. Feedback in this situation enables the teacher to tailor learning material based on the specific requirements of the pupils. Providing feedback may be a difficult undertaking for educators, particularly when dealing with large groups of students. Consequently, many automated feedback methods have been suggested to alleviate the instructor's labor. Despite the increasing research focus on these systems, there is a lack of comprehensive studies that analyze the progress made so far, as documented in the literature.

Introduction

Due to the unprecedented COVID-19 outbreak in 2020, it has become crucial for individuals to remain at home and avoid public spaces in order to prevent large gatherings and the spread of the virus. The implementation of distance learning and remote work saw an unforeseen and fast acceleration. Various obstacles arise when both students and instructors engage in distant learning. The need to explicitly state how to modify learning materials or assignments to suit students' circumstances is emphasized. According to Alhumaid et al. (2020), it is crucial for course designers to provide distance learning courses, as emphasized by Roman and Plopeanu (2021). Insufficiently planning the implementation of distant learning might detrimentally affect students' learning efficacy and their level of involvement (Aboagye, 2021). Instructors seldom assess students' learning progress and difficulties when students engage with the learning platform. When several distant learning systems use evaluation methods to analyze students' learning circumstances, instructors are unable to anticipate future issues or provide appropriate feedback when students get diverted by other distractions when sitting in front of computers. Distance learning is distinct from traditional classroom learning, where students and teachers interact in person. Instructors are unable to immediately notice the learning emotions or concerns of students in their present conditions, which hinders their ability to give suitable interventions or support for students' requirements (Al-Fraihat et al., 2020). Considering the impact of teacher-student contact on students' learning as well as the importance of creating a healthy classroom environment, it is crucial for effective learning in school (Aktekin and Celebi, 2020).

Online learning offers several advantages, including more flexibility and improved connectivity and engagement between professors and students, regardless of their location or time (Hwang et al., 2021). Various forms of online feedback can be employed to accommodate students' individual pace, including e-feedback on written assignments (e.g., utilizing track changes in Microsoft Word), concise notes via email, oral feedback during online meetings, screen-captured video feedback, or automated feedback generated by computer systems (Cheng & Li, 2020; Liu et al., 2021; Ware & Warschauer, 2006). These different modalities offer similar advantages. In an online setting where students remain anonymous and do not reveal their identities, they are more inclined to express their viewpoints to other students and get valuable feedback that is both evaluative and constructive (Alharbi & Al-Hoorie, 2020; Liu et al., 2021).

Feedback is a crucial element in the teaching-learning process as it enables students to recognize deficiencies and evaluate their progress in learning (Butler & Winne, 1995). As to Sadler's (1989) findings, feedback should provide precise information pertaining to a learning activity or process, bridging the gap between the expected and actual comprehension of the subject or the acquisition of skills. By seeking criticism, students aim to refine deficient or subpar information or abilities that impede their learning advancement. Multiple studies have shown that valuable feedback yields advantages in the process of learning (Hattie & Timperley, 2007; Nicol & Macfarlane-Dick, 2006; Parikh et al., 2001). Black and Wiliam (1998) conducted a comprehensive analysis of over 250 studies on feedback. Their findings indicate that feedback has a substantial positive impact on both student learning and satisfaction. In recent research conducted by Henderson et al. (2019), seven case studies were examined using various methods such as theme analysis, case comparison, and reliability verification. The study identified and recommended 12 key factors that contribute to the effectiveness of feedback. The significance of meticulously structuring feedback procedures is underscored by these circumstances, which have been categorized into three distinct groups: capacity, projects, and culture. Feedback is essential in online learning environments since there is an absence of direct connection between course participants (Ypsilandis, 2002).

In online learning environments, when instructors and students are physically apart, it is crucial for instructors to provide excellent feedback to support students in their learning and motivation (Nicol & Macfarlane-Dick, 2006). Tseng and Tsai (2007) discovered that providing reinforcing comments is beneficial for enhancing the quality of students' projects, particularly in an online peer evaluation setting. Nevertheless, the substantial magnitude of the student population in online learning settings might pose difficulties for instructors in delivering valuable and adequate feedback to students. Given this, a number of automated systems have been suggested to improve the process of providing feedback (Belcadhi, 2016; Gulwani et al., 2014; Marin et al., 2017). Engaging in online feedback practice has several problems. Alharbi and Al-Hoorie (2020) noted that technical issues, such as sudden interruptions in online platforms, might discourage second language (L2) students from actively participating in feedback. Individuals may have difficulty managing extensive online discussion threads and responses, which may be overwhelming (Ware & Warschauer, 2006). They may also be unfamiliar with certain types of online feedback, such as video feedback (Cheng & Li, 2020). In addition, whereas students may anticipate receiving prompt and regular online comments about their performance or work (Mory, 2004), such feedback may not always be accessible.

Student engagement refers to the inclination, need, longing, and urge of students to actively participate in and achieve success in the process of learning (Bomia, Beluzo, Demeester, Elander, Johnson, & Sheldon, 1997, p. 294). Effective course delivery in online classrooms necessitates the use of pedagogical techniques that maximize learning and engagement possibilities. Engagement, as defined by Mandernach, Donnelly-Sallee, and Dailey-Hebert (2011), goes beyond cognitive capabilities and instead emphasizes people's attitudes and dispositions towards classroom experiences and lifelong learning. Student engagement refers to the extent of students' interest, their interaction with peers in the course, and their drive to learn about the subjects (Briggs, 2015). Several emotional factors, such as attitude, personality, motivation, effort, and self-confidence, have an impact on student involvement (Mandernach et al., 2011). In their study, Jaggars and Xu (2016) discovered a favorable correlation between the quality of interaction within the course parameters and student grades in online courses. By assessing the degree of student involvement and taking into account these emotional factors, educators may better design classes and activities that will motivate students to actively participate in their learning and coursework (Jennings & Angelo, 2006; Mandernach et al., 2011). Students who possess motivation, involvement, and willingness to expend effort are more likely to be engaged in their education (Mandernach et al., 2011). Course engagement encompasses more than the conventional methods of assessing instructional effectiveness, such as students' mastery of course learning objectives, retention rates, and their satisfaction levels. However, taking into account the influence of instructional activities on student engagement offers a more comprehensive understanding of the teaching-learning process (Mandernach et al., 2011, p. 277). Assessing the degree of student engagement enables educators to modify their teaching methods based on shifts in students' motivation, participation, and attitude towards their coursework and educational endeavors (Mandernach et al., 2011). Online learning platforms provide educators with a plethora of methods to collect informal data about student engagement in the course. Instructors have the ability to assess students' engagement and progress by analyzing log-in data, duration of online activity, interactions with learning materials, and self-reported information obtained via questionnaires, reflections, conversations, and other formative tools (Grey & DiLoreto, 2015). Evaluating the academic difficulty of each course is crucial, taking into account factors such as the amount of work and time required, the opportunity for engagement with professors and peers, active and cooperative learning, and the overall educational enrichment provided to students (Langley, 2006). This may be accomplished by conducting surveys of

students, either informally or officially, and analyzing the findings to enhance educational methodologies for subsequent students. Handelsman, Briggs, Sullivan, and Towler (2005) devised an evaluation of student involvement that examines four categories of engagement: skills, emotions, participation/interaction, and performance. The Student Course Engagement Questionnaire (SCEQ) consists of questions that assess each of the four types of engagement and provide self-reported data that complements the observable classroom interactions (Handelsman et al., 2005). By examining both informal and formal assessments of student engagement, faculty can better assess students' perceptions of their engagement and the effectiveness of their courses, which in turn promotes and maintains learning throughout their academic journey and beyond (Mandernach et al., 2011, p. 280).

Theoretical Framework

Achievement Goal Theory (AGT)

Four eminent academics—Carole Ames, Carol Dweck, Martin Maehr, and John Nicholls—developed achievement goal theory (AGT), a widely used framework for understanding student performance, in the late 1970s (Elliot, 2005). According to Elliott & Dweck (1988, p. 11), an accomplishment objective is a set of cognitive processes that result in cognitive, emotional, and behavioral outcomes. According to this theory, students' motivation and behaviors associated with accomplishment may be comprehended by examining the intentions and motivations they have while participating in learning activities (Ames, 1992). According to much research, there are four techniques that may be used to attain a goal: mastery approach, mastery avoidance, performance approach, and performance avoidance (Hansen & Ringdal, 2018; Mouratidis et al., 2018). The academic performance of pupils is influenced by their surroundings (Ames & Archer, 1988). Historically, classroom instruction has been a successful approach to achieving educational objectives (Clayton et al., 2010). However, in contemporary times, internet-based teaching has emerged as an equally effective means for delivering lectures, with web-based apps serving as modern classrooms (Azlan et al., 2020).

Empirical Studies

In a study conducted by Corbeil (2007), the focus was on examining the effective utilization of technology in the process of teaching English as a Foreign Language (TEFL). The study aimed to assess the academic performance of students and their attitudes towards the use of PowerPoint presentations in the classroom. This research focused on a cohort of 56 female pupils that were enrolled in a school in Lar. The pupils were divided into two groups: the experimental group and the control group. The control group received instruction using conventional tactics, while the experimental group was instructed using technology in the form of a video projector and PowerPoint. The findings indicated that the learners in the experimental group outperformed those in the control group, achieving higher scores on the exam.

Michael Fedisson (2009) examined the impact of using PowerPoint presentations on students' academic performance and attitudes. The research lasted for a duration of two years. In the first year, the seventh grade was segregated into two distinct groups: one including 28 boys and the other consisting of 31 girls. These groups were then separated into experimental and control groups. In the second year, the groups included 32 males and 32 girls, separated into two groups: experimental and control. The experimental group in both the first and second groups received instruction using PowerPoint presentations, whereas the control group received instruction using the student's book. The findings indicated that the groups that

received instruction via PowerPoint presentations in both the first and second years achieved significantly higher scores compared to the control group.

In Yilmaz-Soylu's (2009) study, the objective was to examine the impact of different learning styles on students' academic performance in different learning settings. The research had two groups: the experimental group and the control group. The control group received instruction using conventional methods such as text-based and narration-based approaches, while the experimental group received instruction through computer-mediated methods. The findings indicated that the learning style used significantly impacted pupils who received instruction via computer-mediated means.

Gurbuz et al. (2010) examined the impact of PowerPoint as a tool for learning. The research included two distinct cohorts of 109 freshmen undergraduates enrolled in a biology program: the experimental group, consisting of 56 students, and the control group, consisting of 53 individuals. The first cohort received instruction using PowerPoint, whereas the subsequent cohort was instructed using the conventional methodology. The findings indicated that using PowerPoint methods for instruction may enhance the academic performance of undergraduate students in the field of biology.

Ahmed (2011) conducted research on the effectiveness of using videos and PowerPoint presentations to improve students' academic performance and knowledge retention. The control group consisted of 35 pupils from the first secondary school, whereas the experimental group included 36 kids from the first secondary school. The first cohort received instruction using conventional methods, including the use of blackboards and direct lectures. The second group was instructed via the use of mixed methodologies. The findings indicated that the students in the experimental group had a more favorable and elevated response compared to the students in the control group.

Ozaslan and Meden (2013) investigated the efficacy of using PowerPoint presentations in enhancing students' academic performance. Based on their investigation, he reached the conclusion that pupils have a preference for visual materials, and their learning is enhanced when they are exposed to photographs. The experiments included two groups: a control group that was taught using conventional procedures, and an experimental group that was taught using PowerPoint presentations. The findings indicated that the use of PowerPoint presentations in the classroom has the potential to enhance students' academic performance. Nevertheless, the research demonstrated that PowerPoint presentations do not enhance short-term memory.

In their study, Kazu and Demirkol (2014) examined the impact of PowerPoint presentations on the academic performance of high school pupils. The research sample included 54 students, who were separated into two groups. The experimental group consisted of 19 males and 8 females, whereas the control group consisted of 18 males and 9 females. The researcher used pre-test and post-test measures. The results indicate that there was no statistically significant difference between the two groups at the end of the pre-test. However, in terms of the average final test grades, the experiment group outperformed the control group by 33 points. Additionally, female students demonstrated greater success than their male counterparts.

In a study conducted by Lari (2014), the efficacy of using technology, namely PowerPoint presentations, in teaching at Lar Secondary School was examined. The research had a total of fifty-six students, who were divided into two distinct groups: the experimental group and the control group. The control group received instruction via conventional techniques, while the experimental group received instruction through the use of PowerPoint, a projector, and

video. The findings indicated that the use of technology in instruction had a notable and beneficial impact on learners who were taught via PowerPoint presentations.

METHODS AND MATERIALS

The researchers used a cross-sectional survey methodology for their inquiry. The objective of the strategy is to examine, elucidate, and define the current correlation between variables at a certain time period. This pattern is an effective method for gathering a substantial amount of data that may be used to get a deeper comprehension of issues and identify solutions.

Data Collection and Sampling Procedures

The survey was created and administered using Google Forms. Students actively engaged in the study by providing their responses using a link sent via WhatsApp and email. The sample size of 145 was determined using the methodology proposed by Krejcie and Morgan (1970) for a population above 250,000. The use of a snowball sampling technique helped to further identify the kids. Due to the inability to physically visit tertiary campuses for contact information collection, researchers opted for a snowball sampling technique. The interconnections among participants enhanced the snowball technique's efficacy in locating them for researchers. Less than 500,000 questionnaires were distributed in this study. However, only 145 students from NOUN participated in the research. Participants were required to have been enrolled for a minimum of one semester prior to the survey. The surveys that failed to indicate the educational level and/or the academic institution of the respondents were ignored. A grand total of 145 surveys were collected, and each and every one of them was deemed usable.

Instrument

The research used the students' responses and feedback on the Virtual Learning Environment Questionnaire as its primary instrument. The questionnaire consists of two sections. Section A is dedicated to gathering demographic information, whereas Section B specifically addresses the concepts of self-reliance and dependency. The Cronbach's alpha coefficient for the amended questionnaire was 0.87.

Technique for Analyzing Data

With the help of IBM's Statistical Package for the Social Sciences (SPSS) version 22, this research was able to evaluate its data and achieve its goals.

RESULTS AND DISCUSSIONS

Answering Research Questions

Research Question One:

What is the effect of feedback mechanism on students engagement during virtual Class

Table 2: Mean rating analysis of feedback mechanism on students Engagement during virtual Class

S/N	Feedback mechanism on students engagement during virtual Class	X	SD	Decision
1	The instructor effectively used assessment methods that align with virtual learning	3.05	1.65	Agree
2	The virtual class environment promoted a sense of community and collaboration	2.97	1.39	Agree
3	The virtual class format allowed for meaningful interaction with classmates	2.95	1.36	Agree
4	The workload in the virtual class was reasonable and manageable	3.21	1.41	Agree
5	The instructor provided prompt and helpful feedback on assignments and questions	2.98	1.48	Agree
	OVERAL INDEX	3.03	1.45	Agree

Legend: X = Mean; SD = Standard Deviation; N: 145

Table 2 presents the findings of the research study pertaining to how feedback mechanisms affect student engagement during virtual classes. The entire index had a grand mean of 3.03 and a standard deviation of 1.45. Item 4 indicates that the assertion "The workload in the virtual class was reasonable and manageable" has the highest average score of 3.21. Conversely, the statement "The virtual class format allowed for meaningful interaction with classmates" has the lowest mean score of 2.95 and a standard deviation of 1.36. Therefore, based on the above analysis, feedback mechanisms affect students' engagement during virtual classes.

Research Question Two:

What is the effect of feedback mechanism on performances during virtual Class

Table 3: Mean Rating analysis of effect of Feedback mechanism on students performances during virtual Class

S/N	Feedback mechanism on students performances	X	SD	Decision
1	I believe that the feedback I receive contributes positively to my overall performance in virtual classes	3.27	1.55	Agree
2	The feedback I receive in virtual classes enhances my understanding of course materials.	3.21	1.24	Agree
3	The feedback mechanisms used in virtual classes have a positive impact on my overall learning experience.	2.85	1.35	Agree
4	The feedback I receive in virtual classes is instrumental in my academic success.	3.04	1.33	Agree
5	I believe that effective feedback mechanisms are crucial for students' performance in virtual classes	2.88	1.58	Agree
	OVERAL INDEX	3.04	1.41	Agree

Legend: X = Mean; SD = Standard Deviation; N: 145

Table 3 presents the findings of the research study pertaining to how feedback mechanisms affect students performances during virtual classes. The entire index had a grand mean of 3.04 and a standard deviation of 1.41. Item 1 indicates that the assertion "I believe that the feedback I receive contributes positively to my overall performance in virtual classes" has the highest average score of 3.27. Conversely, the statement "I believe that effective feedback mechanisms are crucial for students' performance in virtual classes" has the lowest mean score of 2.88 and a standard deviation of 1.53. Therefore, based on the above analysis, collaboration affects the emergence of new businesses.

Implication of Findings

The assessment of feedback mechanisms on students' engagement and performance during virtual classes at the National Open University of Nigeria has provided valuable insights into the effectiveness of feedback in the online learning environment. The study aimed to understand how feedback influences students' engagement and academic performance in a virtual setting. In conclusion, the assessment of feedback mechanisms on students' engagement and performance during virtual classes at the National Open University of Nigeria provides valuable insights for educators and policymakers. The findings underscore the need for a well-designed and responsive feedback system in online education, promoting student engagement, and fostering an environment conducive to academic success. Continued research and implementation of effective feedback strategies are essential for optimizing the virtual learning experience.

Limitations and Future Research

Although these studies provide evidence about the significance of many elements of course design, organization, planning, social interaction, engagement, and instructor presence, it is important to note that these results may not be applicable to different online learning settings. Students were told to reply to the survey with a specific course in mind, which may have constrained their responses in relation to the many concepts being measured. The participants were allowed to complete the online instrument many times, providing responses for various courses, given that most students are concurrently enrolled in multiple courses. We recognize that these comments may have perhaps exaggerated the outcomes for each individual. We use prudence when reading these items and drawing conclusions about the variations in the underlying, latent characteristics represented by the Likert numbers. However, this does not render the findings regarding the numbers erroneous. Hence, it is evident that further examination and experimentation with the data obtained from this device are important.

Conflict of Interest

During the research, we state that there is no conflict of interest.

AUTHOR CONTRIBUTIONS

Both authors made effective contributions to the completion of this research.

ETHICAL AND LEGAL CONSIDERATIONS

Throughout this study, we have made certain to adhere to the relevant data privacy laws and regulations. The processing of personal data did not occur in a manner that would disclose the identity of the students or violate legal and ethical regulations. All data have been anonymized, depersonalized, and used with modified attribution. For example, we eliminated all names and modified student identification numbers to ensure that no clue or indication of the student's identity was revealed.

REFERENCES

- Aktekin, N and Celebi, H (2020) ELT Student Teacher Identity Construction: Exploring Teacher Roles And Domains Of Expertise. *International Journal of language Education*, Vol. 4 No.1, March 2020 pp. 113-128
- Al-Fraihat, D. Mike, J. and Raed, M. and Jane, S. (2020) Evaluating E-learning systems success: An empirical study, *Computers in Human Behavior* Volume 102, January 2020, Pages 67-86
- Alharbi, M.A., Al-Hoorie, A.H. Turnitin peer feedback: controversial vs. non-controversial essays. *Int J Educ Technol High Educ* 17, 17 (2020). <https://doi.org/10.1186/s41239-020-00195-1>
- Alhumaid et al. (2020) Qualitative Evaluation: Effectiveness of Utilizing Digital and Social Media in Education. *Utopía y Praxis Latinoamericana*, vol. 25, no. Esp.6, pp. 466-476,
- Ames, C. (1992). Achievement goals and the classroom motivational climate. In D. H. Schunk, & J. L. Meece (Eds.), *Student perceptions in the classroom* (pp. 25-57). Hillsdale, NJ: Lawrence Erlbaum.
- Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology*, 80, 260-267.
- Azlan AA, Hamzah MR, Sern TJ, Ayub SH, Mohamad E (2020) Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. *PLoS ONE* 15(5): e0233668.
- Biggs, J. (2003). *Teaching for quality learning at university: What the student does*. Buckingham: Society for Research into Education & Open University Press.
- Bomia, L., Beluzo, L., Demeester, D., Elander, K., Johnson, M., & Sheldon, B. (1997). *The Impact of Teaching Strategies on Intrinsic Motivation*. ERIC Document Reproduction Service No. ED 418925, Champaign, IL: ERIC Clearinghouse on Elementary and Early Childhood Education.
- Cheng & Li, (2020) An empirical investigation of users' voluntary switching intention for mobile personal cloud storage services based on the push-pull-mooring framework. *Computers in Human Behavior*, 92, 198–215.
- Clayton, K., Blumberg, F., & Auld, D. P. (2010). The Relationship between Motivation, Learning Strategies and Choice of Environment Whether Traditional or Including an Online Component. *British Journal of Educational Technology*, 41, 349-364.
- Corbeil, G. (2007). Can PowerPoint presentations effectively replace text-books and blackboards for teaching grammar ? Do Students Find Them an Effective Learning Tool ? *CALICO Journal*, 24 (3), 631-656.
- D.L. Butler, P.H. Winne (1995) Feedback and self-regulated learning: A theoretical synthesis. *Review of Educational Research*, 65 (1995), pp. 245-281,
- Elliott, E.S. and Dweck, C.S. (1988) Goals: An Approach to Motivation and Achievement. *Journal of Personality & Social Psychology*, 54, 5-12. <https://doi.org/10.1037/0022-3514.54.1.5>

- Gray, J.A. and Diloreto, M. (2016) The Effects of Student Engagement, Student Satisfaction, and Perceived Learning in Online Learning Environments. *International Journal of Educational Leadership Preparation*, 11. <https://eric.ed.gov/?id=EJ1103654>
- Handelsman, Briggs, Sullivan, and Towler (2005) Jype-a program visualization and programming exercise tool for Python Proceedings of the 5th international symposium on Software visualization, ACM (2005), pp. 153-162
- Hansen, G & Ringdal, R (2018) Formative assessment as a future step in maintaining the mastery-approach and performance-avoidance goal stability. *Studies in Educational Evaluation*. Volume 56, March 2018, Pages 59-70
- Hwang et al., (2021) Effects of a social regulation-based online learning framework on students' learning achievements and behaviors in mathematics. January 2021 *Computers & Education* 160(6):104031. DOI:10.1016/j.compedu.2020.104031
- J. Nicol, D. Macfarlane-Dick (2016) Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education*, 31 (2006), pp. 199-218
- Jaggars, S. S., & Xu, D. (2016). How Do Online Course Design Features Influence Student Performance? *Computers & Education*, 95, 270-284. <https://doi.org/10.1016/j.compedu.2016.01.014>
- Jennings & Angelo, (2006) How Do Online Course Design Features Influence Student Performance? *Computers & Education* 95(2). DOI:10.1016/j.compedu.2016.01.014
- Kazu and Demirkol (2014) The Effects of Student Engagement, Student Satisfaction, and Perceived Learning in Online Learning Environments
- L.C. Belcadhi (2016) Personalized feedback for self assessment in lifelong learning environments based on semantic web, *Computers in Human Behavior*, 55 (2016), pp. 562-570
- Langley, D. (2006). The student engagement index: A proposed student rating system based on the national benchmarks of effective educational practice. University of Minnesota: Center for Teaching and Learning Services.
- Lari, F. S (2014) The Impact of Using PowerPoint Presentations on Students' Learning and Motivation in Secondary Schools. *Procedia - Social and Behavioral Sciences* 98 (2014) 1672 – 1677
- Lin, C. L., Jin, Y. Q., Zhao, Q., Yu, S. W., & Su, Y. S. (2021). Factors influence students' switching behavior to online learning under COVID-19 pandemic: A push-pull-mooring model perspective. *The Asia-Pacific Education Researcher*, 30, 1–17.
- M. Henderson, M. Phillips, T. Ryan, D. Boud, P. Dawson, E. Molloy, P. Mahoney Conditions that enable effective feedback. *Higher Education Research and Development*, 38 (2019), pp. 1401-1416
- Ozaslan, E. N., & Maden, Z. (2013). The use of power point presentations at in the department of foreign language education at middle east technical university. *Middle Eastern & African Journal of Educational Research*, Issue 2.

- P. Black, D. Wiliam (1998)Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice*, 5 (1998), pp. 7-74
- Parikh, A., McReelis, K., & Hodges, B. (2001). Student feedback in problem based learning: A survey of 103 final year students across five Ontario medical schools. *Medical Education*, 35, 632-636.
- S. Gulwani, I. Radiček, F. Zuleger (2014) Feedback generation for performance problems in introductory programming assignments. *Proceedings of the 22nd ACM SIGSOFT international symposium on foundations of software engineering*, ACM (2014), pp. 41-51
- V.J. Marin, T. Pereira, S. Sridharan, C.R. Rivero (2017) Automated personalized feedback in introductory java programming moocs. *2017 IEEE 33rd international conference on data engineering (ICDE)*, IEEE (2017), pp. 1259-1270