Improving teaching within public administration courses: Advances in classroom using peer assisted learning

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Abstract

The objective of this paper is to demonstrate how the introduction of peer students assistants (PSAs) approach may increase the teaching and learning experience for students and the teacher within the public administration courses. In 2015/16 11 students acted as PSAs within the course Project Management. Students were divided into two segments: (i) groups of students with PSA leaderships, and (ii) groups of student without PSA leaderships. Testing of the difference between two groups results revieled the difference regarding effectiveness, overall quality and student satisfaction within the class in favour of the first groups. Results demonstrate that the use of PSA approach has multifold positive effects on teaching and learning.

Points for Practitioners
The method and results are useful for teachers in Public Administration at the University level who wants to increase the quality and effectiveness of pedagogical process, their teaching, and beyond.

Keywords: peer student, pedagogical process, teaching assistant, public administration, teaching innovation

1. Introduction

The motivation for engaging and improving teaching in public administration courses at university level lies in main challenge of finding ways of how to successfully and effectively work with large groups of students, and how to promote and increase active participation among students within classes, especially in large groups. Apart from the mail challenge, the following questions were also taken into consideration, namely:

- How to *spark students' interest* in the subject?
- How teachers can *help students* improve their *study*?
- How to help students to *study regularly*?
- How to *train* students' *leadership competences*?
- How to immediately identify *an appropriate level of challenge for students?*

Quality teaching and learning is essential for developing knowledgeable citizens, building resilient economies and sustainable futures. Employers seek graduates who possess an extensive range of abilities and skills in order to work and communicate effectively beyond their specialisation (Hill et al., 2019). In this respect university curriculums are adapting to these requirements, and courses are now oriented to foster lifelong learning, and therefore, are expected to develop in students what are variously termed transferable skills, key competencies, generic attributes or capabilities (Boud, 2001). At the same time, international trends in higher education demonstrate a transition from traditional teacher centered approach to more student centered approach (SCA) (Schreurs and Dumbraveanu, 2014), and teaching withing higher education courses that have large numbers of students and low faculty-to-student ratios can present a great challenge (Durán et al., 2012). This usually demands great efforts for individual teacher to maintain or even improve the quality and efficiency of teaching process.

Educational literature demonstrates several studies that explore how to increase the quality and effectiveness of pedagogical process by incorporating different methods that focus on peer learning and teaching (Chapin et al., 2014; Erie et al., 2012; Findlater et al., 2012; Pinder-Grover et al., 2011; Rodriguez-Sabater, 2005; Ross and Cameron, 2007). It has been proven that the use of peer learning and teaching bring cognitive, pedagogical, attitudinal, social and economic benefits, among others (Goldschmid and Goldschmid, 1976; Ross and Cameron, 2007). The most general definition of peer learning is offererd by Topping (Topping, 1996):

"Peer learning means that people from similar social groupings who are not professional teachers helping each other to learn and learning themselves by teaching."

Further, several other definitions that use different analogous expression have been found in the literature. When refearing to peer learing researchers use expressions like near-peer facilitators (Anstey et al., 2014), peer assisted learning (Srivastava et al., 2015), peer teaching assistants (Rodriguez-Sabater, 2005), structured teaching assistants (Erie et al., 2012), peer educators (Owen, 2011), peer assisted learning and collaborative learning (Ross and Cameron, 2007), (near) peer teaching (Andrew Jay et al., 2013; Durán et al., 2012; Galal et al., 2017; Qureshi et al., 2013; Tran et al., 2014), utilization of peer teaching assistants (Rodriguez-Sabater, 2005), peer leaders (Skipper and Keup, 2017), self directed learning (Findlater et al., 2012), and peer mentors (Metcalf et al., 2016; Pinder-Grover et al., 2011), among others. For a detailed overreview and different terms for peer learning in the literature and sinonims see Ross (Ross and Cameron, 2007). Further, different definitions of peer learning are discussed. Peer learning teaching has been largely used in all academic disciplines, particularly in medical studies, engineering. Ross and Cameron describe it as peer assisted learning approach, wher peer students help their peers to learn. In this case all students are from similar social groupings to the learners (although not necessarily from the saeme course or year of study) and are not themselves professional teachers or 'experts' in the subject (Ross and Cameron, 2007). Peer learning in its broadest sence may be defined as "students learning from and with each other in both formal and informal ways" (Boud, 2001). Similarly, peer learning can be understand as "helping each other to learn", and is adequately broader that the term "inclose peer participation" in virually all educational activites that are perfomed by professional teachers in both informal and forma settings (Kjellin et al., 2003; Ross and Cameron, 2007). Some researchers (Srivastava et al., 2015) define peer learning as an effective instrument to promote learning and retention of knowledge, where students are encouraged to construct their own learning program, so that they may explain effectively to fellow learners.

Peer teaching and near-peer teaching both play an essential educational role (Tran et al., 2014). Near-peer teaching is quite similar to peer teaching. Researchers (Durán et al., 2012) describe near-peer teaching as an educational format that utilizes tutors that are more advanced in a curriculum's content to supervise students' activities and to act as instructors in laboratory settings teaching assistants. Near-peer teaching is usually performed in groups with high faculty-to-student ratio and is widely regarded as an effective teaching modality (Andrew Jay et al., 2013). Academics (Durán et al., 2012) argue near-peer teaching satisfies the demands of modern curricula but is limited to small groups. Neer-peer teaching is frequently used in medical schools where it not only provide additional learning opportunities for medical students, but also increases the pool of tutors available to students, helps facilitate both practical and small group teaching and has other advantages, such as peer tutors being more approachable than senior staff. One of the main reasons for establishing near-peer teaching is due to beneficial output for students, because it offers one-to-one learning experience which helps to provide clinical skills and can thus partly substiture the bedside teaching that is in decline (Qureshi et al., 2013). Furtnermore, researchers (Findlater et al., 2012) demonstrate that the introduction of supported self-directed learning enhanced students' engagement, leading to deeper learning and better understanding and knowledge of anatomy. In medical practical sessions, students are provided with a custom-made workbook that guides them through each session, with academic staff, postgraduate tutors, and near-peer teaching assistants present to deal with misunderstandings and explain more complicated topics. Results demonstrate that due to self-directed learning an increase in the average anatomy practical spot examination mark is reported. Less students also fail to obtain the pass mark and more students pass with distinction (Findlater et al., 2012).

The term structured teaching assistant (TA) is also commonly used in the literature (e.g. Erie et al., 2012). It is often used in medical education, where programs, both nationally and internationally, have implemented and continue to provide established opportunities for under- and post- graduate students to develop teaching skills. Teaching assistants (TAs) across diciplines can serve as positive resources for both students and instructors, where TAs can also aid instructors in managing discussion, classroom group work and grading, among other duties (Weidert et al., 2012). Furthermore, researchers (Chapin et al., 2014) use term peer educators that present graduate teaching assistants (GTAs) or undergraduate teaching assistants (UTAs) who provide instruction in laboratory class sessions and may be a powerful addition to classroom learning environments.

Literature offers three basic way of involving peer students in the pedagogical process, namely:

- graduate student teaching assistant (GTA) and junior doctors assistant (Andrew Jay et al., 2013; Chapin et al., 2014; Findlater et al., 2012; Gill and Hu, 2006; Goldschmid and Goldschmid, 1976; Metcalf et al., 2016; Qureshi et al., 2013);
- undergraduate student teaching assistant (UTA) from higher class (Chapin et al., 2014; Felege, 2018; Goldschmid and Goldschmid, 1976; Owen, 2011; Philipp et al., 2016; Roderick, 2009; Weidert et al., 2012) and;
- peer student assistant (PSA) from the same course or class (M'mworia, 2009; Ross and Cameron, 2007).

Henceforward, the review of the literature regarding the involvement of peer students in the pedagogical process is discussed in the following way. Firstly, the literature regarding the engagement of graduate PSAs in the class is presented. Secondly, the use of undergraduate PSAs is demonstrated, and thirdly, the literature that discusse the involvement of PSAs from the same class or course is presented.

1.1 Graduate teaching assistants

The literature review demonstrate the use of graduate peer student assistant (PSA), i.e. teaching assistant (TA), has been the most frequently used approach at the university level. In the 1960s as pioneers in this field Goldschmid and Goldschmid conducted the most early recorded study of including teaching assistants in the pedagogical process (Goldschmid and Goldschmid, 1976), where graduate students teaching assistants helped with grading and leading discussion sections, and undergraduates TAs assisted in classroom as peer instructors. PSA have been very often used in medical courses. Survey conducted by Tran et al (Tran et al., 2014) demonstrate that recently graduated doctors are in a best position to help deliver teaching and learning, because they have recently been through the transition process themselves. 49 medical students and 122 TAs state that 98 % of mentors and 100 per cent of mentees would recommend the scheme to their peers. Results from Andre Jay et al. (Andrew Jay et al., 2013) demonstrate that graduate students that served as near-peer TA in the anatomy-based student-as-teacher program achieved core competencies of a medical educator and felt prepared for the teaching demands of residency. Survey results conducted by Quereshi (Qureshi et al., 2013) from Edinburgh University inducate that involvement of recently graduated senior doctors serving as TAs in both practical and in small group teaching is found more approachable than from senior staff. 111 medical students that retuns the survey state that having a TAs present improved their confidence in clinical examination. Moreover, their results show that students who had attended one of the 30-minute prescribing tutorials led by TAs were significantly less likely to make a dosing error in a mock examination.

Lidren et al.(Lidren et al., 1991) examined the effects of two levels of peer tutoring on the academic performance of 193 undergraduate students. Their study show that the use of experienced graduate TA helped undergraduate TA how to hold tutorials, organize group work, and how this can increase the academic performance of college students. By analysing near-peer education researchers (de Menezes and Premnath, 2016) demonstrate how undergraduate students that performed duties of TAs developed their teaching skills, revealed mutual benefits for TAs ans colllegue students. Further, Anstey (Anstey et al., 2014) demonstrate how senior students that serve as near-peer facilitations and help their jouniors peers bring a distinctive student-based perspective to teaching. Their results reveal that inclusion of near-peer facilitators in the pedagogical process stipulates group creativity and student's motivation for study. Researchers (de Menezes and Premnath, 2016) demonstrate that the inclusion of graduate TAs help to improve preparation and perceived performance in summative examinations. Similarly, Brusi et al. (Brusi et al., 2013) addressed the challenge of high drop-offs from Precalculus, a large group format (150 students) math course within the Precalculus Mega Section project. Researchers argue these high failure rates represent a great academic, human, and administrative costs. By employing graduate TAs that helped students with difficulties Brusi et al. demonstrate significant reduction in terms of students' withdraw and failure rates.

1.2 Undergraduate teaching assistants

Apart from graduate students that are used as TAs (Andrew Jay et al., 2013; Galal et al., 2017; Owen, 2011), undergraduate student are also often found to perform work of teaching assistants, and numerous studies demonstrate how the use of undergraduate peer students may have positive effects on student learning. Annis (Annis, 1983) analysed realistic classroom effecto of tutoring or being tutored, Her results demonstrated that tutoring resulted in significantly greater content-specific and generalized cognitive gains than being tutored. Similarly, Benware and Deci (Benware and Deci, 1984) showed that students who learned in order to teach (active orientation) were more intrinsically motivated, had higher conceptual learning scores, and perceived themselves to be more actively engaged with the environment than subjects who learned (with passive orientation) in order to be examined. Lindren et al (Lidren et al., 1991) found out that undergraduate peer tutors can enhance the academic performance of college students. These "peer educators" help other students to improve their learning and motivation, and increase their comprehension of the study material. Topping (Topping, 1996) found evidence that peer tutoring improved tutee attitudes in class, as well as tutee self-concept. Several other early studies (Barr and Tagg, 1995; Benware and Deci, 1984) indicate that use of undergraduate peer educators in classroom has a positive effect on TAs because it increases their comprehension while at the same time improve class members' motivation and learning.

Rodrugues-Sabater (Rodriguez-Sabater, 2005) demonstrate that employment of students as teaching assistants that are not graduate students is starting to attract attention in higher education as undergraduate are not very far removed from the novice students in knowledge, age, and status. Further, Owen (Owen, 2011) demonstrates that undergraduate teachin assistants are frequently selected from students who previously excelled at the course they are instructing, and the mastery of material is a natural outcome (Owen, 2011). The most acknowledged advantage of serving as a peer undergraduate teaching assistant is opportunity to learn by teaching (Owen, 2011). What means that in the process of organizing, learning, and synthesizing the study material for the purposes of teaching, it appears to require different cognitive processes than those used in the rote memorization of material (Annis, 1983; Bargh and Schul, 1980; Benware and Deci, 1984). Another study (Chapin et al., 2014) show that undergraduate students can perform tasks of TA in laboratory class sessions equally well as graduate TAs. Similarly, Gill and Hu (Gill and Hu, 2006) use undergraduate teaching assistant that had recently completed the course to perform as peer-to-peer activities. Their results demonstrate that the use of undergraduate TAs may give similar positive learning outcomes, comparable when using graduate TAs.

Weidert et al. (Weidert et al., 2012) analyse the benefits of using undergraduate and graduate students as TA. The analysis of 70 UTAs/GTAs online self-report survey demonstrate that perceived benefits of the UTAs experience are higher than GTAs. UTAs demonstrate that the increase in their responsibilities was associated with more satisfaction, enjoyment, and perceived benefits. UTA rated themselves as using humor and an engaging teaching style significantly more frequently than those TAs that were GTAs. Similarly, in marketing classes the results from Metcalf (Metcalf et al., 2016) provide evidence that peer mentoring increased content mastery and had a positive effect on students' perceptions of the learning experience. Similarly, Rodrigues-Sabater (Rodriguez-Sabater, 2005) demonstrate that inclusion of undergraduate teaching assistans in a foreign langage course results in high percentage of students who reported an improvement in vocabulary, speaking, grammar, and pronunciation.

In a study Owen (Owen, 2011) examines innovative uses of peer undergraduate TAs as partners in pedagogical process. Her results demonstrate that involvement of undergraduate TAs in the preparation, delivery, and evaluation of classroom-based learning increases student ownership of the learning environment and boosts peer interest in the transformative possibilities of education. Similarly, at the Renaissance College at the University of New Brunswick in Canada, Roderick (Roderick, 2009) demonstrate how serving as an undergraduate TA can impact a student's learning and engagement and how undergraduate TA impact student learning. By conducting analysis of interview data combined with a review of relevant literature she indicate that seven good practices associated with undergraduate teaching assistantships emerged and demonstrated how the use of undergraduate TAs can increase students's assessments of college performance.

Chapin et al (Chapin et al., 2014) performed a performance comparison between a series of two introductory biology classes and one third-year class demonstrate that students with UTA and GTA peer leaders earn comparable final course grades. Further, UTAs and GTAs are considered effective at encouraging a positive attitude toward science and fostering a positive laboratory environment, although the UTAs receive slightly higher scores on two of the assessments of attitude toward science. Their results demonstrate that appropriatelly well-trained UTAs and GTAs have equivalently benefitial effects on laboratory learners. Further results showed that UTAs can fulfil the tasks of TAs eqally well as their GTAs colleagues (Chapin et al., 2014). In another study Galal et al. (Galal et al., 2017) compare peer (first-year) and near-peer (second year) students as TAs. The evaluation of sixteen peer and 33 near-peer TAs by 210 first-year pharmacy students demonstrate no significant difference between peer and near-peer TAs in both student perception of TA performance and in TA grading of student performance.

1.3 Teaching assistants from same course or class

Conservatively, the university science teaching model depends on graduate (GTA) and undergraduate teaching assistants (UTAs) to deliver instruction in class sessions (Chapin et al., 2014). However, there is increasing evidence that peer students assistants from the same class or course can fill an equivalent role if instructed properly. Correspondingly, Ross and Cameron (Ross and Cameron, 2007) denote a possibility of recruiting peer student from the same course or year of study, who are not themselves professional teachers or 'experts' in the subject. Though, peer students usually have less expansive knowledge of subject matter, less developed teaching skills and less authority than UTA and GTA, their results (Ross and Cameron, 2007) demonstrate that peer students from the same course of class can also do the teaching with positive outcome. Similarly, M'Mworia (M'mworia, 2009) engaged students from the same class in the course titled "Introduction to Biblical Studies," at the Edward Waters College, to serve as teaching assistants. Since M'Mworia started using this strategy she reports a hugh increase in students' engagement and interest in the class. In another example Galal et al. (Galal et al., 2017) evaluavate differences between the use of first-year (P1; "peer") versus second-year (P2; "near-peer") students as teaching assistants (TA) in a first-year, skills-based course. Their findings demonstrate there is no

difference in the use of peer versus near-peer TAs in evaluating first-year pharmacy students in the skills-based course. Galal et al. fount out that using peer TAs over near-peer TAs can be beneficial when faced with scheduling and other resource conflicts.

Graduate students as teaching asssistants are the most commonly used form of assistance in the pedagogical process. The use of undergraduate students at TAs is also quite often applied. However, researcher (Topping, 1996) found evidence that same-age tutoring appeared as effective as cross-age tutoring, and training of tutors significantly improved eventual outcomes. So, we may go a step further and explore the possibilities of involving undergraduate students from the same class or course to act as TAs during a lecture or turorial.

The aim of our paper is to analyse this last option, i.e.: how peer student assistants (PSAs) from the same course can act as teaching assistant and as team leaders in class sessions and whether their activities contribute to the quality of pedagogical process. The use of PSAs may be a powerful addition to classroom learning environments. Until now, apart from rare exeptions, (Galal et al., 2017; M'mworia, 2009; Ross and Cameron, 2007), this research question has not been systematically adressed in the literature and our aim is to fill this gap. The objective of the research is to demonstrate how the introduction of PSAs approach may increase the teaching and learning experience for students and the teacher within the public administration courses.

1.4 Hypothesis

Based on theoretical background and literature overview, we formulated one baseline working hypothesis, namely:

Groups with peer student assistants demonstrate higher level of effectiveness, overall quality and student satisfaction and within the class in comparison with groups without peer student assistants.

We tested the following hypothesis, namely:

$H_{0\ A}$: Groups with peer students assistants demonstrate same level of effectiveness within the class as groups without peer student assistants.
$H_{0\ B}$: Groups with peer students assistants demonstrate same level of overall quality within the class as groups without peer student assistants.
$H_{0\ C}$: Groups with peer students assistants demonstrate same level of student satisfaction within the class as groups without peer student assistants.

Further, we test which competences the PSA approach brings to students that acted as TA and team leaders. This study is exploratory in nature. Thus, the findings should provide a good starting point for researchers to embark on a more comprehensive study of the use of the PSA approach in public administration course in Slovenia, and beyond.

2. Data and methodology

The basis for this research was The Strategy of the Faculty of Public Administration (2014-2020), Second Pillar: People. Second Pillar defines two elements Competences of empoyees, and Students and graduates. Within Competences of employees the strategy defines three priority objectives, namely: "compent employees", "improvement of pedagogical work", and "improvement of research work". Within "students and graduates" the strategy defines two priority objectives, namely: "motivated student", and "increasing the quality of the cooperation of all participants". In the 2015/2016 academic year in order to follow these priority objectives a pilot project was conducted at the Faculty of Administration (FA), University of Ljubljana, within the course Project Management (Higher Education Professional Study Programme in Administration 1st Cycle, 2nd year). In academic year 2015/2016 13 students acted as peer student assistants (PSAs) within the course Project management. These 13 PSAs that aacted as teaching assistants and as team leaders were interviewed and 13 self-reported questionnaires out of 13 (response rate 100.00 %) were returned and analysed. The PSA approach was introduced at the first class session and was applied in the class on the third session, where first two sessions were traditional ex cathedra lectures, and 13 lectures were compined with the activities of PSAs to facilitate a collaborative, nads-on learning experience. The tasks of PSA encompass obligatory pre-class meeting with the teacher, independent preparation for class using guiding questions and supplementary study material, active leadership of a group of 4-6 students within the class, and weekly ex-post evaluation of performed work, among others. The read thread of the PSA approach may be briefly explained in the following way, namely: (i) construction of healthy study habitats, (ii) supplementary study material with guiding questions for the PSA; (iii) regular weekly meetings prior to lectures; (iv) conducting lectures with PSA and; (v) reflection of teaching with improvement guidelines and self-reflection of the teacher.

Within the course Project Management, for testing similarities and differences students were divided into two segments, namely: (i) groups of students with PSA leaderships, and (ii) groups of student without PSA leaderships.

Using a quantitative statistical analysis testing of the difference between two population means was carried out in order to find out whether difference regarding effectiveness, overall quality and student satisfaction within the class exist. We performed a comparison of averages of one variable for two groups of units (two independent samples). After the finalization of the course a detailed semi-structured interviews were conducted with 13 PSAs.

3. Results

Testing of the statistical difference between two groups revieled statistically significant results in favour of the groups with PSAs. The difference was found in all three estimated parameters, namely: effectiveness, overall quality and student satisfaction within the class (all tests statistically significant at $p=0,05$). Further, student self-survey also demonstrated several interesting points for further discussion. 13 students that acted as peer student assistants within the course Project management reported how valuable and important was the correspondence, constant techer's feedback and guidelines of their work as leaders within the group work section. All 13 PSAs reported the PSA approach helps to increase the quality and effectiveness of pedagogical process. The PSA approach was reported to enable an intense, active and accelerated teaching process, because it helped to increase the work tempo in majority of students' groups, and helped to boost group conversation and active student's participation. Peer student assistants reported that the PSA approach helped to strengthen their professional knowledge, experience and their leadership competences. Results from 13 PSAs self-surveys demonstrated students also obtain additional competences, namely:
- being a leader helped me to obtain general study competences;
    o I am able to report on the results of the project and on the contribution of the team members (13);[2]
    o I know the importance of economic evaluation of projects and I am able to select and use an appropriate method for evaluating investment projects (10);
    o I am able to establish a simple project organization and distribure tasks to team members so that the project is implemented as soon as possible (12);
    o I am able to analyse the course of the project with the emphasis on quality control (7);
    o I am able to prepare a project pland and report on its progress (13);
- being a leader helped me to acquire subject specific competences;
    o I am able to independently plan and implement different project solutions using the case study approach (9);
    o I am able to manage the basic parameters of project managememnt and I am able to achieve project goals using information and communication technology (11);
    o using elements of PRINCE methodology in the public sector (9);
    o evaluation of project and project results (7);
    o coherent mastering of basic knowledge, networking and application of knowledge in other fields and applications - public sector economics, quality assurance in the public sector, development planning in various areas of the public sector, preparation and management of investment projects (13);
    o being a leader is to be responsible for members of the group (11)
    o the experience in the role of the leader demonstrated me that I want to be a leader in my future professional work (8);
    o being a PSA require constant coordination between the teacher's instructions and group activities (12);
    o the experience in the role of the team leader demonstrated me that I was able to be a good leader (7);
- being a leader;
    o enable me to practice public appearance (12);
    o increased my self-confidence (8);
    o gave me valuable practical experience how it is to be a leader (13);
    o made me more self-iniciative (10);
    o is very hard and challenging (4);

o   makes me feel more relaxed in the class (3);
o   require proper organization, delegation of tasks and explanation of instructions (13);
o   require higher level of result-oriented behaviour (6).

4.   Discussion

Emprirical preliminarly results demonstrate that peer student assistant (PSA) approach is a useful pedagogical tool to improve higher education teaching and classroom environment. In general preliminary results prove that the PSA approach has several positive effects on both teaching and learning, and on the pedagogical process in general. The use of this instrument is shown to increase both quality and effectiveness of the pedagogical process. Although, some PSAs reported that their role as a TA and a leader was stressfull and very hard to some extent, all PSAs reporete that the PSA approach was very useful in increasing students' motivation and participation within the class. Our results are in line with results from other researchers (Chapin et al., 2014; Galal et al., 2017; M'mworia, 2009; Ross and Cameron, 2007) showing that recruiting students from the same course, who are not themselves "experts" in the subject can have beneficiary effect on teaching outcomes. Our results demonstrate active undergraduate peer student assistant from the same class can perform the duties of the TA equally well as their senior graduate or undergraduate students from higher class. The experiment analysing groups' dynamics with PSAs and without PSAs demonstrated that groups with PSAs were found to be more effective, demonstrate higher overall quality and student satisfaction within the class in comparison with groups without PSAs. Further, we demonstrated that the use of the PSA approach has several other positive effects. Being TA and team leader enabled all PSAs to obtain general and course specific competences to a certain limit. As group leaders PSAs we also able to acquire several different leadership competences like sense of proper organization, delegation of tasks and explanation of instrucitons, practical experience how it is to be a leader, and give PSAs a chance to practive public appearance.

5.   Conclusion

Using students as peer student assistant in the pedagogical process may be seen as an emerging trends in thigher education pedagogy. The research results reveal that the use of PSA approach has beneficiary effects for pedagogical practice, because it increases efficiency and quality of pedagogical process. This approach not only improves skills of PSA and students' knowledge of the subject, but also students' overall satisfaction with the course. Furthermore, this approach offers teacher direct and effective real-time feedback on the teaching and allows immediate improvements. The PSA approach thus appears to be a potentially powerful technique for increasing all levels of teaching and student learning. In this paper we offer some initial interpretations of the results. More analysis of the results is needed to examine the differences assessed between the two groups in order to fully address the above stated hypothesis.

6.   LITERATURE

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