

STUDENTS' ATTITUDE TOWARD PEER-ASSESSMENT: THE CASE OF ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY FOURTH YEAR COMPUTER SCIENCE AND ENGINEERING STUDENTS, ETHIOPIA

KUMSA DONIS LIKISA (PhD)

ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY, SCHOOL OF HUMANITIES
AND SOCIAL SCIENCES

ABSTRACT

The main objective of this study was to examine students' attitude toward peer-assessment (PA) and their understanding of the benefits of PA. To achieve its objective, the study employed the System Theory. The main sources of information were 160 fourth year undergraduate students. All students taking cognitive psychology were included in the study. Questionnaire, focus group discussion and interview were used to gather information from the respondents. In the analysis of data, mean, SD, correlation and t-test were employed. The study reveals that students' attitude toward PA varies with their understanding of the benefits and the degree to which they involved in PA. With careful preparation, design and execution, students have a positive view of PA and understand its educational benefits. Finally, recommendations were given based on the major findings to improve the quality of students' PA.

Keywords: Attitude, intervention, peer assessment, university students.

1. INTRODUCTION

In all walks of life, people learn from and make assessments or judgements about each other. Student learning in higher education is no different. Students learn from explaining their ideas to colleagues (peer learning) and providing feedback (that may or may not include grading) on the quality of each other's work (peer assessment) (Wride, 2017). Assessment (where peer assessment is a part) is the process of collecting, analyzing, organizing, interpreting information about students' quality of learning (Brown & Knight, 1994). There are five major kinds of assessment: placement assessment, formative assessment, diagnostic assessment, summative and the ipsative assessment. Placement assessment is used to evaluate the entry performance or prerequisite knowledge and skills to assign students to courses commensurate with their past achievements. Formative assessment which is also called assessment for learning is used to monitor students' learning progress. Diagnostic assessment is used to identify students' recurring learning difficulties. The summative assessment which is also called assessment of learning is used to determine the extent to which the instructional objectives have been achieved and is used primarily for assigning course grades or for certifying student mastery of the intended learning outcomes. Ipsative assessment is a kind of self-assessment which is used to compare present performance with past performance at individual level. Peer assessment (PA) is usually taken as a part of formative assessment where the student learns from feedback received from assessor(s). PA requires students to provide feedback or grades (or both) to their peers on a product, process, or performance

based on the criteria of excellence (Falchikov, 2005). PA is a natural extension of the move from a teacher-centred to a student centred mode of education. It emphasises taking responsibility and the active engagement of students in their learning. It is metacognitive, dialogical and collaborative model of learning (Spiller, 2012). Broadly speaking, PA may be said to occur when students comment on or evaluate the quality of their fellow students' work using a set of agreed criteria and providing each other with feedback (Topping, 2009; Van Zundert et al., 2010). The criteria are to consider the level, value, worth, quality or successfulness of the products or outcomes of learning of others of similar status (Topping et al. in Sitthiworachart and Joy, 2004; Liu and Carless, 2006). In the process, constructive alignment must be established between criteria, assessment process and learning outcomes.

The practice of PA has long past, but a short history. It has a long past as it is a part and parcel of human life as alongside we live with others in community; it has a short history because it was very recently that PA has got recognition in learning institutions. It has got recognition for it has possibly enormous benefits in terms of learning gain as students take on the role of teachers and examiners of each other. As it was a part of social process, a theory of PA draw on social constructivism- the joint construction of knowledge through discourse and other interactivity-even when assessor and assessee have no face-to-face contact (Topping, 1998).

Now days, as part of diversification of assessment instruments and the need to use multiple methods to assess multiple talents for multiple audiences (Brown & Knight, 1994) PA is increasingly becoming an effective learning tool (Nulty, 2009) in higher education settings as an alternative form of evaluation method (Wen and Tsai, 2006). Basically, the principles applied to PA are the same as principles in other forms of assessment. Race (2001) identified three major principles of assessment: validity, reliability and transparency. Validity refers to measure what assessment tool sets out to measure. Reliability refers to consistency, fairness, and objectivity of assessment. Transparency is the fact that students are well aware of the standards expected of them to gain particular awards, and the nature of the evidence that they will need to supply to demonstrate their achievement of the intended learning outcomes. Taking these principles into account, it has been used in higher educations to involve students more actively in decision-making and assessment process such as presentations, performances, practical work, poster displays, portfolios, exhibitions, essays, reports, and designs at varying degrees (Race, 2001; Wheater, Langan & Dunleavy, 2005) in order to develop student's higher cognitive skills and lifelike assessment (Sitthiworachart & Joy, 2004) as students are already self-assessing and peer assessed quite naturally (Race, 2001). Race further elaborates the reasons to PA that tutor assessment is not sufficiently valid, reliable or transparent as students actually doing it; promote learning by assessing; let students into the assessment culture and understand how tutors' minds work when assessing their own evidence in more formal circumstances; help students towards becoming autonomous learners; and help them develop skills in their continuing professional development long after they have gained their university qualifications.

PA also gives students opportunity to identify their own strengths and weaknesses, target areas for remedial action, and develop meta-cognitive and other personal and professional transferable skills (Boud, 1990; Topping, 1998); increases the student voice in the learning process (White, 2009); develop skills of evaluating and justifying by using discipline knowledge (Topping, 1996; Sitthiworachart & Joy, 2004); enhance cooperative learning (Divaharan & Atputhasamy, 2002; Nagel, Ebert-May, Weber, and Hodder, 2005) or extended learning from the private and individual domain to a more public domain (Liu & Carless

2006), and shift students' role from passive recipients to more self-directed learners (Puntambekar & Boulay, 1999). It also reduces staff marking loads (Wheater, Langan & Dunleavy, 2005); develop high levels of responsibilities and a sense of ownership for their peers' learning (Dochy, Segers & Sluijsmans, 1999); develop students' critical and higher order thinking skills where assessment is part of learning and mistakes are opportunities rather than failures. Furthermore, students gain a better understanding of criteria and standards of assessment (Brown, Rust and Gibbs, 1994; Zariski, 1996; Race, 1998; Nulty, 2009; Willey and Gardner, 2009).

Spiller (2012) identified that PA builds on a natural process of development from early life (learning from others) which inculcate sense of ownership of the assessment process. In PA students gain a more sophisticated understanding of the gaps in their learning and gain a better grasp of the learning process through conversation and feedback. It promotes student writing skills, heightens the capacity for judgement and making intellectual choices that reduces the power imbalance between teacher and students.

Despite the growing popularity of PA, this idea is still novel to most Ethiopia teachers and students in the university. Traditional assessment is still dominant where an alternative assessment method such as PA is overlooked. Universities put emphasis on measuring learning achievement and knowledge through paper and pencil tests including multiple-choice, essays, and short-answer tests. Although the education and training policy of 1994 encourages the use of varieties of assessment methods, most teachers rely too much on the conventional paper-and-pencil test. Teachers usually give one mid semester exam out of 30 or 40 and a final exam out of 50 or 60. The rest 10% or 20% of students' assessment goes to attendance, assignment, class activity or presentation. Hence, assessment is dominated by a relatively narrow range of assessment instruments. Specially, assessment for learning is almost absent. Most of these few assessment methods are usually imposed on students by teachers. Students have almost no role and involvement in decision making process about their assessment. This is partly because teachers want to maintain the old status quo, and partly because they think that it is only through paper and pencil test that talents and abilities come out.

Moreover, familiarity blinded them the weaknesses that can be embodied in this small range of assessment, and many of the teachers seem to lack technical skills and knowledge of innovative assessments and their benefits (White, 2009). There are also some teachers who have negative attitude and feel that alternative assessment techniques are imposed by external authorities. The other sources of academic staffs' resistance are opportunity costs and feeling that it is time-consuming. Indifference, friendships (not to mark down their friends), egalitarian feelings or hostility (mark down), the possibility of being discriminated against, bias or lack of reliability, and being misunderstood by peers are some of the sources of challenges. Moreover, the view that it is the teachers' 'job' to assess (because of perceived expertise) (Cheng & Warren, 1997; Falchikov, 2003; Liu and Carless, 2006), power relations, time available and variability of marking standards used by peer assessors are the other challenges.

It was also found that negative peer rating feedback produce significantly lower perceived performance, lower peer ratings on a subsequent task or retaliate against peers and result in significant personal conflict between group members and reduce true cooperation and teamwork (DeNisi, Randolph, and Blencoe, 1983). The collection and collation of data through PA is time consuming, lower discrimination power between student grades

(Divaharan and Atputhasamy, 2002) and the tendency to give higher marks to the noisy, showy, extrovert members of the group and lower marks to the quieter members, who may equally have made significant contributions to the group process, but who tend not to make so much noise about it are the other challenges. Sometimes idle or lazy students will ride on the backs of other students and thereby claim credit for work they haven't achieved. Personal and gender/race bias and prejudice may also creep in to assessment schedule (Brown & Knight, 1994). But there is a time when negative ratings conceivably could motivate a student to try even harder in order to improve the ratings received. Male students had more positive attitudes toward PA than females did, and students with previous PA experiences had less negative attitudes toward PA. Subsequent analyses also found that university students generally held positive attitudes toward general PA activities (Wen and Tsai, 2006). From studies, Yan Zou, Christian Dieter Schunn, Yanqing Wang & Fuhui Zhang (2017) reported mixed results that some students held positive attitudes towards and were overall receptive to PA, other have negative attitudes towards PA implementation due to perceived low reliability of student ratings, perceived expertise of assessors, power relations among students, time available to do the activity and the appropriateness of grades based on PA.

Consequently, the idea that assessment shapes the curriculum and serves as an engine to drive learning (Brown & Knight, 1994) or serve as a means to an end is not at work as required. The very limited techniques of assessment used by teachers adversely affected, especially, students' motivation and performance in the higher learning institutions as they do not take students' needs, diversity and learning style into consideration. Hence, they are victims of these limited assessments as most students' attritions are attributed to assessment procedures used in the higher learning institutions (Kumsa, 2008).

One of the problems in diversifying assessment tools is the inability to use PA. It is scarcely used by teachers because they have very limited knowledge about PA (White, 2009). Their skills in employing PA also seem to be very limited. Moreover, they seem to have negative attitude towards PA. That is why most teachers insisted on the old and traditional methods of assessment. Students are not exceptional in this case. From the researcher's informal personal observation and discussion with students, the researcher come to realize that they are reluctant in using PA as they have no exposure to it in the lower grades and thinking that assessment is purely teachers' job. They also perceive PA as a fault finding practice. These are partly because of lack of awareness and partly because of lack of confidence in the precision of their assessment. But less is known regarding student perspectives of assessing and being assessed by peers and study was not made in this university to identify the problem and in so doing come up with possible solutions, at least to the researcher's knowledge. Consequently, one should inquire about the status and major factors responsible for effective use or otherwise of PA in Adama Science and Technology University, department of computer science and engineering (CSE). Therefore, this investigation is intended to unearth the underlying problems in the implementation of PA in department of computer science and engineering fourth year students and come up with possible guidelines so as to encourage colleagues to create awareness of students on the benefit and include PA strategy in diversifying assessment. The study is also intended to help colleagues make wise and informed decisions about which elements of the curriculum may best lend themselves to this alternative assessment approach, and to alert colleagues about inherent risks in adopting this approach. Hence, this research aimed at answering the following research questions:

1. What are the attitudes of students toward PA? Why?
2. What are the factors affecting students' perception and attitude toward PA?
3. What are the guidelines in implementing effective PA?

2. RESEARCH METHODS

2.1 Subjects

In this study, 160 fourth year computer science and engineering students were used as source of information. Convenience sampling was used in the selection of the group for questionnaire administration, focus group discussion and interview as the researcher was assigned to teach them a course. The questionnaire was administered to 130 students. The focus group discussions were done with 24 randomly selected students by dividing them into four groups (six students in each group). Besides, six students were interviewed. The selection of interviewees was done purposefully before the selection of students for questionnaire administration and focus group discussion. These students who participated in focus group discussion and interview were excluded from questionnaire administration.

2.2 Instruments and procedures

Student reactions to PA were solicited by means of questionnaire, focus group discussion and semi-structured interviews. The questionnaire has three sections: demographic information about research participants, attitude scale and challenges in the implementation of PA. The attitude scale was adapted from Wen, Meichun Lydia and Tsai, Chin-Chung (2006) and Yan Zou, Christian Dieter Schunn, Yanqing Wang & Fuhui Zhang (2017) works that have three subscales. The subscales are Positive Attitude Subscale (POS) – a general endorsement of the benefits of PA, interpersonal negative Subscale (UAS) – concerns about the negative effects on interpersonal relationships and procedural negative Subscale (NAS) – doubts about the procedural rationality of PA. The reliability of the POS subscale was 0.86, reliability of UAS was 0.63, and reliability of NAS was 0.64, and the composite reliability was 0.80.

To understand what students thought about PA: Students indicated their degree of agreement on a Likert scale of 1 (strongly disagree) to 5 (strongly agree) with statements about the usefulness of peers' and one's own feedback, the positive and negative nature of peers' and one's own feedback, and the fairness of peer grades etc.

Focus group discussion was done with the selected 24 students and interviews were conducted with six students before discussing on the benefits of PA and practically using it to evaluate each other. This was just to get preliminary information and evaluate their attitude before intervention (which refers to training on the benefits of PA and practice on how to use PA in the teaching learning process to improve students' learning). Then PA criteria were prepared together with students and they had used the criteria to give peer feedbacks after each group work and presentation without orientation on the procedures and benefits of PA. After peer feedbacks in the first four rounds, the same instruments were employed to know the reaction of students toward PA. After organizing students' reaction from questionnaire and preliminary discussion and four rounds group work and presentation and peer feedbacks to see the underlying problems in using PA, orientation was given to students on philosophy, theory, meaning, types, purposes/role/benefits and procedures of PA as they lack knowledge in and experience of PA – if PA is to be effective, then students should first become familiar with the concept of peer learning. Thus, one of the mechanisms used was preparing eight hours brief explanations and discussions on the philosophy, theory, purposes and processes of assessment in general and PA in particular. This has been done on four consecutive days (two hours explanation and discussion on each day). Besides, a brief hand out was given and important reference materials for further reading were suggested. The second mechanism used was giving two hours orientation on the assessment criteria, how they are set and how to rate one's performance based on its quality. The researcher also told them, as a novice assessor, the need to take free rehearsal on the first few instances. The third mechanism that the researcher has used was being model on how to assess/rate, give feedback and justify

their ratings and judgments. In doing so, in each group work and presentation they have been given chance to assess and give feedback before the researcher’s assessment and feedback. These measures helped them to see into the strengths and weaknesses of their assessment as they can compare their judgments with that of the researcher.

Furthermore, orientation was given on lesson presentation assessment criteria and the need to justify why we marked/rated high, medium or low, etc. This was followed by another four round group work, presentations and feedbacks to examine if there is any difference between students attitude/reaction to PA before and after orientation and exposure to PA.

The themes of questions for the focus group discussion and interviews were in line with the research questions. They are about the purposes, attitudes (what they like and dislike about PA) and students’ attitude toward PA.

2.3 Method of data analysis

In the analysis of data, descriptive statistics such as mean, SD, per cent and inferential statistics such as t-test were employed in the analysis of quantitative data. Comparison was done between students’ attitudes toward PA before and after orientation and exposure to PA using t-test. Thematic content analysis was employed in the analysis of qualitative data. In the process, recurring themes were identified from students’ reaction, interpretation was made, integrated with quantitative analysis and comparison was done with key ideas in research questions and literatures.

3. RESULTS AND DISCUSSION

In this section, data obtained from the respondents are presented and analysed in line with the research questions. Presentation of data and results are followed by brief discussions.

3.1 Results

Table 1: Summary of Mean score and Standard deviation on students’ Attitude towards PA before and after intervention

Subscale	Item and description	Before Intervention			After Intervention		
		Mean	SD	Remark	Mean	SD	Remark
Positive Attitude Subscale (POS)	1. PA is helpful to my learning in identifying my strengths and weaknesses.	2.42	0.89	-ve	4.08	0.75	+ve
	2. PA makes me understand more about teacher’s requirement.	2.34	0.89	-ve	4.01	0.81	+ve
	3. PA activities can improve my skills in communication.	2.55	0.92	+ve	3.87	0.85	+ve

	4. PA activities motivate me to learn.	2.31	0.98	-ve	2.90	0.86	+ve
	5. PA activities increase the interaction between my teacher and me.	1.93	0.96	-ve	3.54	0.87	+ve
	6. PA helps me develop a sense of participation.	2.23	0.87	-ve	3.55	0.74	+ve
	7. PA activities increase the interaction between my classmates and me.	2.64	0.82	+ve	3.28	0.88	+ve
	8. I think PA is fair to assess students' performance.	1.97	0.87	-ve	3.06	0.84	+ve
	Average	2.26	0.90	-ve	3.54	0.825	+ve
Understanding- and- Action Subscale (UAS)	9. PA activities help me understand what other classmates think.	2.72	0.74	+ve	4.18	0.92	+ve
	10. The teacher should develop criteria of PA activities for students.	3.12	0.75	+ve	4.21	0.98	+ve
	11. Students should participate in the development of criteria for PA activities.	2.06	0.71	-ve	3.87	0.86	+ve
	Average	2.63	0.73	+ve	4.09	0.92	+ve
Negative Attitude Subscale (NAS)	12. I think students should not be responsible for making assessments.	3.40	0.91	-ve	2.14	0.76	+ve
	13. PA is time-consuming	2.53	0.80	-ve	2.23	0.87	+ve
	14. My marks giving to classmates are affected by the marks given to me.	3.85	0.96	-ve	2.67	0.82	-ve
	15. PA impairs friendship.	4.09	0.87	-ve	2.63	0.87	-ve
	16. Procedural negative in PA makes me nervous.	2.64	0.72	-ve	2.62	0.78	-ve
	Average	3.30	0.85	-ve	2.46	0.82	+ve

Note that +ve=positive and -ve=negative. Note also that the higher the score on items 12 to 16, the negative the attitude of students towards PA and vice-versa.

From Table 1 above, the result shows that students have negative attitude towards PA (Mean= 2.26) before intervention as it is less than the cut off mean of 2.50. This was

improved to a mean score of 3.54 after intervention. However, they feel PA activities can improve their skills in communication and increase interaction with their classmates even before intervention. Regarding their awareness, they seem to have moderate understanding about PA (mean=2.63) before intervention and this was improved to better/high understanding (mean=4.09) after intervention. Their negative attitude (mean=3.30) shaded out after intervention (mean=2.46). Thus, it can be concluded that students have negative attitude towards PA practices before intervention. This has been improved through training, practice and discussion about the theories and benefits of PA. However, their negative attitude on item 14, 15 and 16 could not be lowered after intervention as their level of agreement on the three items are still little higher than the average point 2.50. It seems that they have the belief that their marks giving to classmates can be affected by the marks given to them, PA impairs friendship and procedural negative in PA makes me nervous. These misconceptions can be circumvented with a carefully designed intensive and extensive intervention programs.

Table 2: Correlations among attitudes held by students towards PA and their understanding (N=130)

		Understanding
Positive Attitude	Pearson Correlation	.626**
	Sig. (2-tailed)	.000
Negative Attitude	Pearson Correlation	-.754**
	Sig. (2-tailed)	.000
** . Correlation is significant at the 0.01 level (2-tailed).		

PA is designed to address the need to use varieties of assessment tools and enhancing students’ cooperative learning through PA and feedback. In this study, it was found that there is strong association between students’ awareness/understanding and their positive attitude ($r=.626$, $p<0.001$). It was also found that there is strong negative association between students’ negative attitude and their awareness level about PA ($r=-0.754$, $p<0.001$). The higher the awareness levels of students, the better their attitude towards PA. Thus, putting awareness creation program in place will help in improving students’ attitude towards PA.

Table 3: Summary of t-test analysis on students’ attitude towards PA before intervention (pre-test) and after intervention (post-test) (n=130)

Variables	Options	Mean	S.D	d.f	t-cal.	t-crit	Sig
Positive Attitude	Before intervention	2.26	0.90	258	11.92*	1.645	0.00
	After intervention	3.54	0.83				
Understanding- and- Action	Before intervention	2.63	0.92	258	14.17*	1.645	0.00
	After intervention	4.09	0.73				
Negative Attitude	Before intervention	2.46	0.85	258	8.10*	1.645	0.00
	After intervention	3.30	0.82				

* Significant t-values

Note that negative statements on negative attitude sub scale were reversed when scored

Results in Table 3 indicate that the calculated t-value of 11.92, 14.17 and 8.10 for students are statistically significant ($p < 0.05$). Therefore, it is concluded that the attitude of students towards PA practices among selected respondents differ with intervention. The highest mean values during the post-test indicate the importance of training students on the concept and benefits of PA. Similarly, from the focus group discussion before intervention, and after the three round group work, presentations and feedbacks, similar results were found across the four groups. Most of the students have very limited knowledge about the role of PA in students' learning and its cumulative effect on the overall students' achievement before intervention. This is partly because teachers never gave them opportunity to assess the work of other students. Even they never used PA in students' group works and group projects that can more conveniently be evaluated using PA. Referring to this research project, they argued that this is the first time when they have formally given opportunity to assess each other. In addition to lack of exposure they have very limited knowledge about the importance of PA as there was no orientation programme on the theory, roles/purposes and processes of varieties of assessment techniques including PA. Lack of exposure and knowledge lead them to suspect the validity and reliability of their peers' assessment. From their limited exposure to PA in this project before orientation and very limited knowledge they have, they stressed disadvantages of PA more than its advantages. Some of their reasons were the possibility for social embarrassment, conflict, frustration and stress when especially the criticisms are harsh ones. Negotiation to focus on the positives aspects and collude to give each other high marks as well awarding 'equal' marks to their colleagues for friendship's sake are the other reasons. Furthermore, they identified the following reasons why they dislike PA: The possibility of using PA for situations that do not call for PA; some use PA as a means to attack others. Some students, for example, use the opportunity to assess peers as a way of settling old scores and use as retaliation from peers to whom they have awarded low marks; apathy and deception or lack of genuine comments; lack of experience and competence in marking, and issue of fairness (feelings that peers were either easy or hard markers).

Similar information was obtained through interview before the orientation programme. For instance, one of the students pointed out that "I think assessment of the peer is not fair. In PA, the awarding of grades might not accurately reflect my achievement. Therefore I think fairness comes when teachers rate students' performance as they are experts in the area." "I don't know for sure whether my ratings of my peers' performance are accurate— I don't know how much I can trust someone who is at the same level as me." However, there are a few students, who have favourable attitude toward PA and stress the importance of PA in improving performance, developing the culture of giving and receiving constructive feedback, giving opportunity to learn from different people's view and approaches and learning from errors made by friends or not to repeat mistakes made by friends.

Based on the information obtained through questionnaire, focus group discussion and interviews, intervention mechanisms were designed to change students' perceptions and attitudes toward PA. After intervention, i.e., orientation on the role and procedures of PA and exposure on how to assess each other, most of the students were convinced of the use and significance of PA in their learning. The interventions were worked because students had formally been given chance to evaluate each other and test it practically and to look at the philosophy and theory behind PA that widen the horizon of their understanding. Through discussion they could also identify numerous advantages of PA. Furthermore, it worked because previously there wasn't a tradition to give feedback publicly and give strong justification. In most cases feedbacks were given to students individually and there were not

strong tradition to justify why we assessed the way we did. There were very limited chance to learn from feedbacks given to others and how to even give feedbacks and justify. After interventions and exposure to PA several positive aspects of PA were identified by students. These positive aspects include its usefulness in supporting each other's learning; convenience for some tasks, practice in taking responsibility to assess others, its positive transfer of learning to their future career; wider opportunity it gives in obtaining feedback on a task; and developing higher thinking abilities.

Among the information obtained through interviews after orientation programme, the following positive aspects of PA can be acknowledged: "PA helped me to make my presentation better. I think it is good system for us to help each other and improve our presentation skills." "PA is helpful for both presenter and evaluator in a reciprocal manner. It helps both improve their skills. I hope it will be used in future lesson presentation classes." "I think that PA is a good way to develop the students' ability to think critically and assess critically. It provides a chance for us to serve as judges and learn how to make a decision which things are good or bad."

Some typical comments made by students were as follows: "I certainly appreciate PA. I appreciate the concept and the spirit of assessing others. And I think, PA can, in some ways, assess the student's performance more effectively and objectively and not only from the teacher's point of view." Some took the intermediate position. Among those taking intermediate position one of the students said "PA process is a good way to improve our presentations. But it is difficult to evaluate presentations precisely. I don't know whether my evaluation to other students is right or not."

In general, from the questionnaire, focus group discussions and interviews there are some three new perceptions and attitudes that appear more strongly and more common among respondents. The first one is that there are some tasks which can effectively and efficiently be evaluated through PA where peers' assessment are more valid and reliable than teachers' assessment, for example, group works, group projects and presentations. The second one is that it is fair as an individual is assessed by many people that enable him or her to see some consistency in feedback. The third one is its contribution to metacognition as they can use their peers as mirrors through which they can see their intellectual growth, higher cognitive skills and achievements. As prerequisites to actual PA, they pointed out that there must be orientation programme(s) on assessment as a whole and PA in particular, criteria needs to be set and some free practice/rehearsal programme must be designed.

3.2 Discussion

Students' perception of and attitude toward PA improved and they liked to be involved in the assessment process after orientation and exposure to the practice of PA. Wen and Tsai (2006) had found similar result for university students. On the contrary, they found PA unfair, stressful and difficult when assessed by peers and sometimes felt awkward in having to judge the performance of their peers as they are not qualified expert markers - a view similar to that expressed by the subjects in William's study (1992). However, on the whole, students' views were positive after orientation and experience in PA as it helps them to see their work from different perspectives. The students felt that PA motivated them to work better in their group work/group project and presentations. In addition, it provided them with a sense of achievement and encouraged them to be more responsible for their own learning through cooperation thereby further developing their higher-order thinking skills by being more critical of themselves and their peers. Divaharan and Atputhasamy (2002) and Nagel, Ebert-May, Weber, and Hodder (2005) have found similar results.

Furthermore, PA as a cooperative learning or as a joint construction of knowledge is useful tool to achieve the desired learning objectives. This is similar to the observation made by Salend and Sonnenschein (1989). Views expressed by students involved in this practice were synonymous with the advantages of introducing PA suggested by past researchers like Keaten and Richardson (1993), Falchikov (1995), Pond, Ul-Haq, and Wade (1995) and Lourdasamy and Divaharan (2000): PA motivates students and makes them more accountable for their contribution to their peers learning (Divaharan and Atputhasamy, 2002). It is also useful as friends know each other as they are actually doing it; even they can give more reliable feedback than teachers in some works, for example, in group works and group projects which were also observed by Race (2001). The idea of giving responsibility for students so that they take the opportunity to exercise on appraising others and positively transfer to real life situation in their prospective careers is also supported by Topping (1998) findings.

The remaining ideas expressed by students like usefulness of PA in developing competitive attitudes, higher intellectual skills, skills useful for future employment comparing and reflecting on their own work, and as a rehearsal to summative assessment have also got support from literatures (e.g., Brown & Knight, 1994; Race, Brown & Smith, 2005; George & Cowan, 1999; Sitthiworachart and Joy, 2004).

To bring about changes of students' perceptions and attitudes resulting from interventions through orientation on the philosophy, theory and concept of PA, the ideas from social constructivism that stresses cooperative learning and modelling from social learning theory were used. The idea of the need for training was also suggested by White (2009) and that of social constructivism was underscored by Topping (1998). In the intervention, the role of setting criteria of excellence to bring about quality assessment through the establishment of valid, reliable, and transparent instruments were also emphasised. The establishment of quality measures bring about students' confidence in the assessment process as a whole and trust PA in particular. Falchikov (2005) suggested similar procedures on how to develop quality instruments and use them. Finally, the idea of exposing students to PA to develop positive perception and attitude was also evidenced by Nulty (2009) and Race, Brown and Smith (2005) writings.

In general, the implementation of PA is essential for cooperative learning and continuous learning progress, especially in the higher learning institutions of Ethiopia where students are mature enough to take responsibility for their own learning. It is also useful in assessing students' performance in courses like practice teaching, peer-teaching, group works in any courses and project works in most engineering courses. However, as William (1992) suggested the intra-group assessment to be done as a confidential exercise, as a large number of students were not in favour of open, face-to-face assessment. The inter-group assessment can be done openly.

Conclusions

The aim of this study was to investigate the attitudes toward and perceptions of CSE students towards PA. It was intended to improve the quality of students' participation in cooperative learning through PA. The views expressed by the students indicate that they perceived PA negatively before orientation, exposure to PA and before looking at appropriate modelling in assessing and giving feedbacks. After intervention through orientation, experience in PA and how to give feedback, they come to realize that their involvement in PA gave them a number of constructive feedbacks and encouraged them to participate actively in group works,

presentations and feedbacks. Therefore, with careful planning and implementation, students have a positive view of PA and understand the educational benefits to them.

Recommendation and Future Research

Well planned orientation programme, the use of very clear marking criteria, appropriate marking scales, and useful marking guidelines, are good practice which helps the process of PA in the higher education of Ethiopia as a whole and Adama Science and Technology University in particular, in some selected courses and almost in all engineering course and tasks like group work, presentations, performances, practical works, portfolios, exhibitions, essays, reports, and designs.

Specific recommendations

For the success of PA the following specific strategies can be sought:

1. Step by step introduction of PA at university level using university website, presentation of papers focusing on PA on research seminars, symposiums, and workshops to create awareness among teachers on the philosophy, theory and results of empirical researches. Furthermore, those who run the Pedagogic Skills Training programme or the Higher Diploma Programme need to be encouraged to give emphasis to PA in their training.
2. Introducing PA on a small scale, before employing on large scale, on selected courses that serves as stepping stone to expand it in other courses. In doing so, in-depth trainings need to be given to those instructors teaching those selected courses who in turn train their students on the theory, benefits and how to employ PA. Besides theories and benefits, the trainings need to focus on how to introduce PA step by step beginning with mark-free and risk-free rehearsal opportunities that gives plenty of time to develop the skills of PA using criteria and standards and then move to the actual ones. It should also focus on how to negotiate assessment and assessment criteria that are valid, reliable, transparent, effective and efficient with students. Furthermore, how to identify courses and tasks lending themselves to PA and the role of being model to students in the practice of assessment and feedback for the success of PA need to be included in the training programme. Finally, emphasis should be given to the crucial relationship between criteria, evidence and peer-evaluation and the need to justify their judgements using evidence that is directly relevant to particular criteria. However, it is preferable to omit PA in the first year as they lack requisite skills for peer-assessment and most of the students take introductory courses that can be entirely be evaluated using mid and final exams.
3. The PA could also be carried out anonymously - both assessor and assessee could be anonymous to reduce student discomfort. It can also be repeated multiple times during the module or course, so as to develop student experience and to build in an element of inter-subjectivity, which makes the marking more objective.
4. Successful peer learning and assessment requires both effective implementation and management. It should be a purposeful and systematic approach integrated into course/module design. The effectiveness of these approaches needs to be monitored through reflecting on the process and the outcomes by both students and academic staff.
5. Developing clear marking criteria (developed and discussed with students if possible) that are aligned with the learning outcomes; providing some training in assessment; using double anonymity of assessors and assessee; having multiple assessors for each piece of work; moderation of student assessments by a tutor.

Future Research

This study was not a rigorously designed, but a report of researcher's attempt to introduce PA into a context where it is not a normal practice. A carefully designed study may shed more light on the usefulness of PA to enhance the participation, quality of involvement in PA and cooperative work and learning.

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