Abstract: The article deals with the use of Aropä peer-review system. Compared to other web e-learning platforms such as Moodle or Blackboard, this free to use system has a relatively limited scope and it allows in particular to upload student assignments and to provide feedback from peers. The authors used the Aropä peer-review system for the first time in the academic year 2016/2017. The aim of this article is to critically analyse the system and to provide experience and feedback on its use during the university course Ethics, Corruption and Transparency. The course has been running for two years at the Faculty of National Economy, University of Economics in Bratislava. The article deals with some practical issues faced by teachers who employ e-learning and peer-review platforms. Among the problems that the authors have experienced and successfully dealt with were: plagiarism, gaming and free-rider problem, student motivation, and contradictory feedback. Aropä proved to be an excellent peer-review system which supported development of critical thinking and reflective skills in students throughout the semester. Furthermore, the authors took a risk and introduced an Anglo-Saxon style into the teaching and assessment of the course in an environment which is still heavily conservative and traditionalist in terms of the teaching methods. Primarily, regular weekly essay writing and peer review through the Aropä system was introduced as one of the three modes of course assessment leading to the final course grade. Students had to write and assess their peers’ essays – both a task and a skill that the Slovak university educational system does not prepare for. The risk paid off and the quality of essays has steadily increased over the semester. Both the teacher and the students found the web-based peer-review system useful and effective in delivering the course outcomes – both in terms of knowledge and skills.

Introduction

Learning and teaching has never been an easy process. Modern trends in education and learning, growing expectations and needs of students and of the labour market, open education and knowledge society are a challenge not only for teachers and educators. E-learning systems or platforms have enabled and helped for nearly two decades to solve many of these challenges. One of these is, for example, ever increasing demands in terms of the interactivity of lessons or lectures, the use of ICT and the emphasis on students acquiring soft skills. E-learning systems allow an increase in flexibility of teaching and studying due to rapid technological development and easy Internet access. Various tools within e-learning systems or specialised e-learning platforms enable development of cognitive and affective capabilities. Furthermore, they support critical thinking; collaborative learning; and among many other soft skills, students can learn how to provide, receive and analyze feedback. Such systems with a narrower focus include PeerWise (Jacková and Denny 2015) and Aropä. They make contributing student learning and mutual feedback through peer review easy and freely accessible. In both systems, students evaluate other students’ contributions. In PeerWise, these test assignments are completed by selecting and explaining one correct answer (Jacková et al. 2016). Aropä allows uploading, sharing and providing feedback on student contributions of various kinds, ranging from short contributions (e.g. solutions to short tasks, specific parts of larger tasks, parts of a computer programme, etc.) to lengthy contributions such as academic essays, projects and reports.
The aim of this article is to critically analyse the system and to provide experience and feedback on its use during the university course *Ethics, Corruption and Transparency*. The course has been running for two years at the Faculty of National Economy, University of Economics in Bratislava. The article deals with some practical issues faced by teachers who employ e-learning and peer-review platforms. Among the problems that the authors have experienced and successfully dealt with were: plagiarism, gaming and free-rider problem, student motivation, and contradictory feedback. The authors would also like to add their perspective to the growing body of research on the use of Aropä (Purchase and Hamer 2017; November 2011, 2012; Welsh 2014; Patterson 2009; MacDonald 2013; Finlay 2012; Huston 2015).

Hamer et al. (2008, 195) define “pedagogy that encourages students to contribute to the learning of others and to value the contributions of others” as Contributing Student Pedagogy (CSP). Peer review is part of this pedagogy (i.e. learning) and Hamer et al. (2011, 83) understand student peer review as a process in which “students look at other students’ work, and provide comments” on this work. Peer review activities encourage development of cognitive and affective capabilities and can help to improve students’ results and student satisfaction (Kubincová et al. 2017). Peer review itself is not limited to online arena only. However, with the rapid technological advancements and easy Internet access, online peer review is more accessible than ever before. Hamer et al. (2011, 91) identify a number of online tools for peer review activities: Aropä, Expertiza, ClassCompass, Moodle Workshop (Moodle plugin), OSBLE, PeerWise, PRAISE (Peer Review Assignments Increase Student Experience), PRAZE, StudySieve, WeBWorK.

Jacková had already used PeerWise and Moodle Workshop at Matej Bel University before using Aropä. PeerWise is a “web-based tool that supports the authoring of multiple choice questions that other students can use and provide feedback on. (http://peerwise.cs.auckland.ac.nz)” (Hamer et al. 2011, 91). Moodle Workshop (Moodle plugin) is a tool “within Moodle enabling the creation and management of workshops, management of submission, grading and peer review” (Hamer et al., 2011, p. 91). PeerWise was used for multiple-choice question creation and use by students at Matej Bel University (Jacková and Denny 2015; Jacková et al. 2016). Jacková also used Moodle Workshop at Matej Bel University for creating and peer reviewing artifacts of other types (e.g. essays, computer programmes). However, the system was not used much due to a lack of user-friendly and intuitive interface. Since the instructor had had no previous training regarding this tool, it was quite difficult to make a full use of the system and adjust it to the needs of both the instructor and students.

Aropä is a web-based “system that supports submission and allocation of reviewers, weighted grade calculation and distribution of feedback. (http://www.dcs.gla.ac.uk/~hcp/aropa)” (Hamer et al. 2011, 91). Russell (2005) introduced another similar peer review tool for writing and critical-thinking called CPR (Calibrated Peer Review, see http://cpr.molsci.ucla.edu). According to Price et al. (2016, 020145-1),
Calibrated Peer Review (CPR) is a web-based system that scaffolds peer evaluation through a ‘calibration’ process where students evaluate sample responses and receive feedback on their evaluations before evaluating their peers.” However, CPR similarly to other peer review and e-learning platforms is not a free of charge system (for the price list, see http://cpr.molsci.ucla.edu/Purchase.aspx) and this makes Aropä more accessible and popular among instructors (Purchase and Hamer 2017).

After reading positive references for content creation and peer review tool Aropä (http://www.dcs.gla.ac.uk/~hcp/aropa/), the authors decided to try and test it in their courses.

Methods
The Aropä e-learning system was first used by the authors in the academic year 2016/2017 at the Faculty of Natural Sciences, Matej Bel University in Banská Bystrica (UMB), and at the Faculty of National Economy, the University of Economics in Bratislava (EUBA) (Jacko and Jacková 2017). At the UMB Faculty of Natural Sciences, Jacková started to use the Aropä system for peer review of semestral projects in three ICT-related compulsory courses:

Semester Project 1 (summer semester, 1\textsuperscript{st} year of the Bachelor’s degree programme Applied Informatics);

Semester Project 2 (winter semester, 2\textsuperscript{nd} year of the Bachelor’s degree programme Applied Informatics);

Informatics Didactics 2 (summer semester, 1\textsuperscript{st} year of the Master’s degree programme Computer Science Teaching in Combination with Subjects).

Based on positive preliminary experience with the use of the Aropä system at the UMB, Jacko also began using this system during the summer semester of 2016/2017 at the Faculty of National Economy EUBA, in the master’s degree selective 6 credits course of Ethics, Corruption and Transparency which was attended by 71 students. The article will refer to him as “the instructor”.

One of the main goals was to test whether and how ICT can be integrated as a teaching and learning tool in the course curriculum. After the authors successfully tested Aropä’s use in an ICT-related course, the next step was to test its functionality in the field of economics and social sciences. Except for own observation as instructors and users, the authors tested overall satisfaction of students with Aropä and also asked some specific questions regarding the various features and functionality of the system. Furthermore, the aim was to test the use of regular essay writing and reviewing as a mandatory part of the final course assessment which was only introduced in the summer semester of 2016/2017 and it was made possible through Aropä. The authors distributed a student survey – feedback on Aropä to all 71 enrolled students. The return rate was 100\% due to the fact that the survey was physically distributed to them at the end of the final exam and then collected and processed by the instructor. The survey consisted of standardised
questions designed by Purchase and Hamer, available for all instructors in Aropä. The authors translated these questions into Slovak and added their own questions regarding both Aropä and the course as a whole.

**Overview and basic functioning of Aropä**

Aropä is an online peer-review system that helps teachers to engage students in peer review activities. Teachers or instructors set assignments and students then upload them to the Aropä system – similarly to any other virtual learning environment (VLE) or e-learning platform such as Moodle, Blackboard, Canvas, etc. However, the system is rather limited in its focus and its key function is to provide feedback on the uploaded assignments through peer review. Aropä was developed, launched and is operated by Helen C. Purchase and John Hamer from the School of Computing Science, University of Glasgow. It is a completely free worldwide system regularly used in more than 20 universities around the world (Picture 1). The system includes a wide range of subjects and disciplines, ranging from anatomy, anthropology, biology and informatics to public administration, and veterinary medicine.

PICTURE 1. AROPÄ'S HOMEPAGE WITH LOGOS OF SOME UNIVERSITIES THAT USE THE SYSTEM

![Aropä's Homepage](http://aropa2.gla.ac.uk/aropa/aropa.php)

Basic procedure for using Aropä:

1. The teacher creates an assignment and sets deadlines for both submitting the task for reviewing and feedback.

2. Students upload their assignment according to the set instructions and a deadline.

3. After the set deadline, the system automatically allocates assignments (instructors can adjust them manually if needed).

4. Students within another set deadline review the allocated assignment(s) and provide feedback according to feedback rubric (again created and adjusted as needed by instructors).

5. After completion of the review phase, students (authors) read feedback from their peers (reviewers).
Teaching Ethics, Corruption and Transparency

The instructor taught the master’s degree course of Ethics, Corruption and Transparency in the form of lectures (Mondays) and three seminars (Mondays, Tuesdays). The course was attended by 71 students. Since this was a selective module, all faculty and university master’s students could have signed up for the course. As a result, students of 6 degree programmes attended the course (Public Policy and Regional Development, Finance, Taxes and Tax Advisory, Economic Policy, Social Policy and Social Development, Banking). The course focuses on the issues of defining and measuring corruption, its causes and implications (e.g. social, economic and political), the fight against corruption and international aspects of corruption. Compared to the previous academic year 2015/2016, when the instructor had taught the course for the first time, the course’s assessment was slightly modified. A student now gets a maximum of 100 points (or 100% equivalent of the final course grade) for the following parts:

- **50%**: one final exam;
- **30%**: one mid-term test;
- **20%**: weekly academic essays.

This paper will focus on the last part of the course assessment. All students had to prepare one essay per week with a word limit of at least 500 words according to the instructions. The essay always referred to the topic which was being discussed in the given week of the semester. Students were thus forced to actively and regularly work with mandatory and recommended literature. In the previous academic year 2015/2016 students also worked with the same reading list, but their weekly task was only to read and write notes. The teacher was physically checking these notes during the following seminar. The notes could have been either handwritten, printed or in electronic format. However, the authors noticed several negative reactions from the students not only during the semester but also in the students’ feedback on the course. Some students did not see much sense in reading and taking notes. Our interpretation is that many of them stopped (or hardly ever started) reading academic literature and/or did not know how to effectively read and take notes. In addition, each student was used to his or her own style of notes: for some students it was enough to merely highlight key words and sentences in the given text, others were noting down too much information. Most importantly, while the authors were checking the notes and discussing their thoughts and opinions on the text, they found out that the students sometimes copied these notes from one another (the electronic form made it easy for them) and that writing even a detailed set of notes did not automatically mean that the student really understood the text.

Hence, the authors tried to improve both the content and the assessment process of the course before the beginning of the 2016/2017 session. Instead of regular, and for many dull and useless note taking, students had to regularly submit and upload their own academic (Anglo-Saxon style) essays into the Aropä system.
Furthermore, they had to review one another’s essays and provide feedback. The innovation itself – i.e. active reading of literature; essay writing, reading, reviewing; but perhaps most significantly its regularity posed a completely new challenge for the students. Despite the fact that most of the students were already in the second (i.e. final) year of their master’s degree, they had not experienced anything like this before. Nevertheless, the system was adopted well during the first weeks of the semester and students later considered weekly assignments to be a standard. In some cases students even asked for the essay topics a few weeks in advance when they knew that in a particular week they would not have enough time for them. This shows that some of them acquired and trained their planning and time management skills.

Slovak education system and in particular Slovak further education system is still heavily conservative and traditionalist in terms of the teaching methods. In March 2017, the Slovak Ministry of Education, Science, Research and Sport published a document “Learning Slovakia” (Burjan et al. 2017) in which it proposes a major reform of the Slovak education system. This should also include a greater emphasis on learning practical and transferable skills. Schools and universities should move from mere memorising and then regurgitating data to understanding, thinking and applying knowledge.

Using Aropä

Each assignment (i.e. essay topic) for a particular week was published in Aropä on Monday evening or Tuesday morning. The students had to write and upload their essays to Aropä by no later than Saturday 23:55 and then had to review two classmates’ essays by Sunday, 23:55. This meant that they had always at least 5 days to write a short essay and one day to review two others.

Although Aropä is relatively limited in scope (uploading and reviewing assignments), it allows instructors to alter many settings according to individual needs. Options and features include (Purchase and Hamer 2017):

- submission methods - uploading various file types (e.g. PDF, Word, ZIP, Excel, etc.);
- allocation methods – setting number of assignments a student has to review;
- reviewing methods - setting reviewers manually, randomly, adding external reviewers and editing review rubric;
- individually manage extensions for submission and review;
- restrict reviewing and receiving feedback to only those students who have already submitted and/or reviewed assignments;
- anonymity – option to anonymize authors and/or reviewers;
- backwards feedback - reviewing the quality of submitted reviews;
- downloading all the submissions and reviews in a text document and all marks in a spreadsheet.
The authors set the system so that the students could only read and review two classmates’ essays after they submitted their own essays. Then the students could see feedback and comments on their essays only after they completed the two reviews. This way, the students were motivated to submit both essays and reviews on time. Of course, essays and reviews were mandatory and part of the final course assessment but the authors wanted the students not to perceive the essays and reviews as something mandatory and hence “evil” but rather as a useful and interesting exercise and a way to acquire and master new skills.

The reason for having each student read and review two essays was to increase objectivity and the quality of the peer review process. This way the teacher saw any discrepancies and through that identified problematic reviewers who regularly reviewed essays significantly differently than the other automatically set reviewer. What is more, each student received 2 reviews that included different comments and tips for improvement even if they were given the same mark. The teacher designed the review process to be easy and fun. The reviewer had to answer the following two open questions and then rate the respective essay:

What do you like about the essay? Why would you praise the author?

What could the author improve in the essay?

Choose a mark for their essay from 0 to 100% (0 worst, 100% best).

Students evaluated the essays of their classmates on a scale of eleven points from 0 to 100%. In order to reconcile the perception of the essays’ quality, a word description of all the marks was provided to the reviewers as a hint in addition to simple number. For example, 30% was described as "You're wasting my time!"; and 80% as: "Super! Interesting reading.". The authors tried to use the language which would be close to the students in order to make the review process more interesting and fun.

Requests, concerns and practical issues regarding Aropä

According to the Aropä system architects (Purchase and Hamer 2017), among instructors’ most frequent requests and criticism has been a lack of integration of Aropä with either the particular university’s student enrolment system or the university’s learning management system (LMS). Purchase and Hamer also mention initial start-up learning costs among the few negative comments from instructors.

Based on our observation and use of Aropä, the authors would also appreciate integration with our universities’ student and learning systems. On the other hand, this could be seen as a potential benefit due to the often obsolete and licenced nature of systems which are not easy to quickly adjust to instructors’ needs. Responsiveness of LMS support staff and technical infrastructure can also pose a problem to smooth running of the system. Not all universities in the world can afford to have a fully integrated student enrolment and learning management system. Furthermore, it took the authors of this paper only a couple of hours to learn about the features and to get used to Aropä which proves its practicality and easiness.
In terms of students’ feedback, according to Purchase and Hamer (2017, 19), many “students are apprehensive about peer review at first, but (they) have found the majority of them recognise the benefits after having taken part”. They add that students “are sometimes sceptical of their peers’ analytical and critical skills, and sometimes complain that what they really want is ‘expert’ feedback”. What is more, based on our own experience, it is not realistic to expect that students will provide quality feedback on a voluntary basis. Thus it is necessary, for example, to link the assignment submission and reviews to the final assessment of the course. Ideally, feedback on student reviews should be provided by the instructor(s) but this is not possible in all cases due to the sheer number of students and the student-teacher ratio.

During the course of Ethics, Corruption and Transparency, the first and second weeks were naturally the most intense in terms of student concerns. Most students requested full anonymity both as authors and reviewers. The first assignment was not fully anonymous due to the fact that some students left their names either in the text or in the file name of the essay. The teacher then asked the students not to write their names anywhere in order to ensure the highest anonymization possible. Nevertheless, some students were still able to identify the authors by meta data (i.e. after downloading the file and checking the properties). Purchase and Hamer (2017) are aware of this issue and included it together with a number of other requests either on the unsatisfied requests list or on the wish list.

Among the very few technical issues that the authors have experienced was Aropä’s incompatibility with the Slovak diacritics. Instead of the Slovak symbols in both the teacher’s instructions and students’ comments, Aropä displayed various numeric characters and hence it was not possible to read some words and comments. Students were then instructed to write comments without Slovak diacritics.

Perhaps the most common pedagogical problems were late submissions of essays mostly due to personal reasons, and high marks given by reviewers. However, these problems were not related to Aropä and all originated in students’ behaviour. Thanks to the possibility to individually manage essay extensions in Aropä, late submissions were not a problem for the instructor and even helped him to keep a track record of those with granted extensions. However, as a result of high average marks for essays given by reviewers (see Chart1 below), the instructor decided not to take them into consideration in the final course grade. Instead, the 20% of the final course grade was awarded based on the number of essays submitted and on the number of nominations for “the essay of the week”. As one of the students put it in the survey, “classmates were often not objective and I know that some of them, on principle, only gave 70% or 80%”. Nevertheless, it can be argued that the quality of essays has improved over time – based on personal observation of the instructor and the average essay scores. Chart 1 below shows a steady increase in the average essay scores except for the last week which collided with master’s dissertation submission deadline. More than half of the course students were in the final year and hence most likely prioritised their
duties in favour of finishing their dissertations. Hence, some students submitted an essay of lower quality contrary to their previous assignments.

**CHART 1. AVERAGE ESSAY SCORES**

Source: authors

Among more significant pedagogical problems were plagiarism, gaming and free-rider problem, student motivation, and contradictory feedback. The authors have already discussed the common practice in the 2015/2016 academic year, when some students were copying other students’ notes and pretended that this was their own work (i.e. free-rider problem). With 55 students last year it was very hard to detect those who were gaming or abusing the system and misusing the trust of the teacher. However, the new form of assessment and the peer review process posed a new challenge in terms of minimising these negative aspects of student learning. Hence, the authors came up with the following 4 preventable measures.

Firstly, one of the reasons for setting **weekly but rather short and easy assignments** (i.e. essays) was to prevent plagiarism and free-rider problem. Students were given essay topics and open questions often based on current issues and news articles. This way it was impossible to find an already existent essay or analysis on the Internet. Furthermore, students had to apply information from recommended reading to the discussed topic. With only 5 days to do but with a minimum word limit of only 500 words, the authors were hoping that students would find it easier to do the essay properly themselves rather than to look for any shortcuts. The authors expected most students would take up to 3 hours to write the weekly essay and the student survey confirmed this. Chart2 below shows that 80% of students took a maximum of 3 hours to write the weekly essay. Nevertheless, most students felt that this amount of time spent on weekly course preparation was too much (!) and that in terms of time demands, this had been one of the most difficult courses throughout their university studies. The authors will further discuss this issue in the Student survey section of the paper.
Secondly, in order to minimise the possibility and motivation of students to plagiarise or to game the system, the teacher each week **randomly chose and read at least 10** of the 71 submitted essays. This way, the authors kept track of the essay writing and students’ progress. During 9 weeks, the instructor noticed only one case of plagiarism. This occurred in the last week’s assignment. Interestingly, the last week saw the lowest number of submitted essays (64 out of 71) and a sudden drop in the average essay scores – as described above (see Chart 1).

Thirdly, the authors wanted to motivate students to write good quality essays and hence allowed all students to **nominate “the essay of the week”**. The teacher received between 1 and 8 essays each week and always chose one of them whose author was publicly given a symbolic prize and his or her essay was then shared with all other students. This way, other students could also read excellent essays and through that improve their own essay writing. What is more, these essay prizes and nominations were also considered during the final course assessment.

Finally, except for giving better quality and more objective feedback to students, one other reason for **reviewing 2 essays each week** by every student was to help the instructor to identify potential troublemakers. The instructor was not only going over a number of essays each week but thanks to Aropä, both authors were able to go over all reviews – both textual and numerical very quickly and efficiently. Having two reviews for each essay allowed the instructor to compare them quickly and detect potential free riders or underperforming students who needed our attention. Chart 3 below shows that **73%** of students spent on average up to 30 minutes on reading and reviewing the two essays each week.
However, **contradictory reviews** posed the most serious problem. The problem of contradictory reviews or contradictory assessment is not so much related to the design and operation of Aropā as such, but it nevertheless results from its use. The authors considered contradictory reviews as those where discrepancy between the two numerical reviews (i.e. marks) was 3 points (equivalent of 30%) or greater (for example when one reviewer awarded 90% and the other reviewer only 60%). Aropā significantly helped and made it easy for the authors to identify these discrepancies due to its function which automatically calculates discrepancies between all the awarded marks. The number of contradictory reviews varied weekly from 2 in week 7, to 12 in week 4. The average number of contradictory reviews was 7.67. Considering the fact that there were 71 students enrolled in the course, the number of contradictory reviews was not significantly high. For more details, see Chart 4 below.

**CHART 4. NUMBER OF CONTRADICTORY REVIEWS**

Our goal was not only to make students learn and acquire new knowledge during the course, but also to learn different soft or transferable skills. One of them was to provide and receive both positive and
negative feedback. Even in the case of contradictory assessment, the students (i.e. essay authors) could still analyze the two different views on their essays and work out why two people evaluated their work so differently.

During the semester, the authors encouraged students to send their essays in case they felt that they did not receive fair or precise feedback. The instructor was contacted by a number of students each week (between 1 and 3) who received either contradictory reviews or both reviews were negative. In some cases, it was obvious that the review was poorly written most probably due to the fact that the reviewer did not invest the necessary time in both reading the essay and writing the review. On the other hand, several contradictory reviews also emerged which were all well-written and substantiated. In such cases, the instructor explained to students that their work can be perceived differently due to the various criteria which were set and which could have been perceived differently by reviewers. Among these was writing style, number and quality of sources used, elaboration of arguments and other predefined criteria. Some reviewers, for example, put more emphasis on the formal aspects of essays than others. Furthermore, the university course Ethics, Corruption and Transparency as a field of study and research belongs to the category of social sciences where it is virtually impossible to provide a perfect answer or to write a professional and flawless essay which is given 100% by all who read it. Social sciences encourage a wide range of opinions, often contradictory, controversial and hard to prove. Therefore feedback naturally may also be very diverse. But thanks to such contradictory assessment and feedback, students can learn to better understand, analyze and deal with different opinions - whether positive or negative - on their work. This skill will come very useful for students in both their private and later professional life. The results of the last question in the student survey confirm the overall usefulness of the peer reviewing experience (see Chart 9).

**Student survey**

The student survey confirmed benefits that Aropä and peer review process in general bring to students. The following Charts 5, 6, 7, 8 below show that a significant number of students agreed or strongly agreed that:

- feedback provided on their work had been useful (56%; disagreed or strongly disagreed 16.9%);
- peer reviewing improved their ability to reflect on their own learning and skills (50.7%; disagreed or strongly disagreed 15.5%);
- peer reviewing improved their analysis and critical thinking (57.7%; disagreed 18.3%);
- peer reviewing has helped improve their own work (62%; disagreed 19.7%).
CHART 5. STUDENTS’ OPINION ON USEFULNESS OF FEEDBACK

The feedback provided on my own work has been useful.

- strongly disagree: 7.04%
- disagree: 1.41%
- neutral: 15.49%
- agree: 49.30%
- strongly agree: 26.76%

Source: authors

CHART 6. STUDENTS’ OPINION ON IMPROVEMENT OF ABILITY TO REFLECT OWN LEARNING AND SKILLS

Peer reviewing improved my ability to reflect on my own learning and skills.

- strongly disagree: 11.27%
- disagree: 1.41%
- neutral: 14.08%
- agree: 39.44%
- strongly agree: 33.80%

Source: authors

CHART 7. STUDENTS’ OPINION ON IMPROVEMENT OF ANALYSIS AND CRITICAL THINKING

Peer reviewing improved my analysis and critical thinking.

- disagree: 2.82%
- neutral: 18.31%
- agree: 54.93%
- strongly agree: 23.94%

Source: authors
Students were also asked to comment on the statement whether overall peer review experience has been useful. Chart 9 shows that 76% of students either agreed or strongly agreed with the statement, only 5.6% of students either disagreed or strongly disagreed and 18.3% of students felt neutral about the statement.

Similarly to Purchase and Hamer’s (2017) observation, many students in the course were apprehensive about peer review at first, but later the majority of them – as evidenced in the conducted survey - recognised the benefits of the process. As mentioned earlier in the paper, most student criticism and concerns were aimed at missing diacritics, contradictory reviews and workload (more details below). On the other hand, students appreciated Aropä and considered it easy to use, clear, user friendly, functional and without any technical problems.

Writing weekly essays and spending 2 to 3 hours a week on reading, writing and then 15 to 30 minutes more on reviewing was perceived by students as way too much work. Students provided three main reasons why they thought so. Firstly, they had neither been used to nor they had experienced this sort of...
regular and weekly assignments during any of their university courses except for this one. Secondly, most of the enrolled students were in their last semester of their master’s degree and hence they had to work intensively also on their master’s dissertation. Thirdly, the majority of students at the University of Economics in Bratislava already have professional part-time or full-time jobs and hence their job often takes priority over their studies.

The authors extracted textual responses from the student survey. Verbatim student comments regarding the peer review process and the Aropä system clearly illustrate overall satisfaction with the system. Students’ comments include:

*It's fine, we could use it for other things too. I would also include evaluation from the teacher because my classmates were often not objective and I know that some of them, on principle, only gave 70% or 80%.*

*The system was fine and easy to orientate it.*

*No concerns except for diacritics.*

*It had everything we needed. Maybe I would like to see some rankings and other features.*

*Quality system – only if it allowed to use diacritics.*

*Super easy and clear to use.*

*Missing diacritics, but otherwise fine.*

*Easy for its purpose. I was very satisfied.*

*Interesting. It improves quality of learning.*

*10/10*

*Super system. I highly recommend it.*

*Positive. It simplifies learning and makes it more efficient.*

*A great website. It could be used more at EUBA.*

*Everything worked as it should.*

*I don’t understand the technicalities but I think that the website was really well designed. I think that more teachers should use it.*

*Except for missing diacritics I don’t have any negative remarks.*

*Fine. Easy, clear, functional.*

*It had its bugs (diacritics).*

*The system is great, easy, clear, precise. It’s the users who are causing the trouble.*
Can be. I would like to have the possibility to comment on the reviews or get rid of anonymity – or upon request show the names.

I liked the fact that I could compare two reviews on my essay.

Very good system. I really liked it. Good quality system.

User friendly. Interesting system. No problems.

**Conclusion**

Whether it is the major e-learning platforms such as Moodle, Blackboard, or more specific and simple web-based systems such as PeerWise or Aropá, all of them can have positive effects on cognitive and affective learning. Regular use of peer review systems can contribute to “improvements in student learning, greater interest in the subject, developing critical thinking, and gaining important personal skills for future life.” (Jacková and Denny 2014, 6).

The authors began to test Aropá in the Slovak university environment in three courses at Matej Bel University in Banská Bystrica. The paper shows that Aropá has also proved to work well at the University of Economics in Bratislava during the second year of the course *Ethics, Corruption and Transparency*. Aropá proved to be an excellent peer-review system which supported development of critical thinking and reflective skills in students throughout the semester. Furthermore, the authors took a risk and introduced an Anglo-Saxon style into the teaching and assessment of the course in an environment which is still heavily conservative and traditionalist in terms of teaching methods. Primarily, regular weekly essay writing and peer review through the Aropá system was introduced as one of the three modes of course assessment leading to the final course grade. Students had to write and assess their peers’ essays – both a task and a skill that the Slovak university educational system does not prepare for. The risk paid off and the quality of essays has steadily increased over the semester. Both the teacher and the students found the web-based peer-review system useful and effective in delivering the course outcomes – both in terms of knowledge and skills.

For successful use of Aropá, it is crucial to make most out of the various options offered by the system. Also, the authors highly advise users and instructors to link the assignments and reviews to the final assessment of the respective course (i.e. make them mandatory), but also to motivate students and explain to them the clear benefits and skills that they will acquire and improve during the peer review process. Based on authors’ experience with working with Aropá, they can only recommend the system to be used in higher education institutions in Slovakia and elsewhere. Flexibility and easy to use interface allow its use in other types of education where it is necessary to work with assignments, peer review and feedback from participants. For instance, Aropá could be used by teachers (i.e. participants) attending teaching skills trainings. Teachers could first learn how to work with the system from the student's
perspective and then implement the system in their own teaching and courses. This way, more teachers will be encouraged to innovate their teaching methods and will make their teaching more interesting and useful for their students.

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References


