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Learning and Teaching of Bookbinding in Graphic Technology through the context of Quality Assurance in Higher Education

Abstract. This research was realized within the Bookbinding course during one semester. The purpose was to evaluate the quality of teaching process through the collaborate principle of learning. For evaluation, survey and questionnaire were used. This evaluation has put emphasis on students' critical thinking about teaching process quality, including different teaching environments. At the end of semester, students completed the evaluation survey and questionnaire form for two teachers, for the one who holds theoretical lessons and for the other one who holds practical lessons. The Bookbinding course curriculum was presented to students at the first theoretical lesson. Students were given precise instructions about all lessons in timetable, together with all their obligations and expectations through semester. The research showed that students prefer collaborate teaching process and that critical system ensures students and learning environment development. They are actively engaged in solving meaningful problems throughout social network model of thinking. In addition, students' comments and suggestions could stimulate teachers to improve theirs teaching and learning processes based on critical thinking.

Keywords: bookbinding engineering, collaborative teaching process, critical thinking, learning outcome, evaluation survey, evaluation questionnaire.

1. Introduction

Since 2005, considerable progress is made in quality assurance. Research and innovations in higher education play a crucial role in supporting social cohesion, economic growth and global competitiveness. European societies are becoming more and more knowledge-based. Increased demand within skills and competences requires higher education to respond in new way. It requires a more student-centered approach to learning and teaching, embracing flexible learning process and recognizing competence gained outside formal curricula. A key goal of the *Standards and Guidelines for Quality Assurance in the European Higher Education Area* is to contribute to a common understanding of quality assurance for learning and teaching across border and among all stakeholders (Standards and Guidelines for Quality Assurance in the European Higher Education Area, 2015; Vraa-Jensen, 2016; Vraa-Jensen, n.d.). These provide guidance, covering the areas that are vital for successful quality provision and learning environments. Preparing students for active citizenship throughout future careers (students' employment), supporting personal development, creating a broad advanced knowledge base, stimulating research and innovation represent the basic aims in European higher education

system. Educational process mainly refers to quality of the interaction between teachers, students and institutional environment. Thus, learning opportunities with adequate learning environment and facilities have to fit with the content of course program. This are entrusted to the institution's performance, to improve the quality, together with students, academic staff, the institutional leadership and management. This also include external stakeholders such as employers and partners of an institution. Together, they set a common framework for quality assurance system for learning and teaching at European, national and institutional level. European qualification framework (EQF) was developed in 38 countries in 2015. It starts to make an impact on education, training and employment policies and practices. Each country developed National qualification framework (NQF) based on learning outcomes, specifying what learners are expected to know to be able to do and understand at the end of learning sequence (Pasanec Preprotić, 2015; Pasanec Preprotić, 2017). This sets up comprehensive frameworks, which are covering all levels and types of qualifications. The Croatian qualification framework (CROQF) act was established in 2013, based on learning outcomes, which are defined in terms of knowledge, skills, responsibility and autonomy (CQF-Introduction to Qualification, 2011; Cedefop, 2015). The teacher's role is important factor in creating a high quality student experience and enables the acquisition of knowledge, competences and skills. Thus, students have to focus on learning outcomes stronger, throughout collaborative teaching process (Figure 1), which includes community, collaboration process, interactions, brainstorming, discussion and sharing ideas (Duron 2006; Pasanec Preprotić, 2017).

Figure 1. Collaborative teaching process

Student-centered learning and collaborative teaching process change the role of teacher. Teaching ex-cathedra style "from the seat of authority" is replaced and teacher became moderator. Such learning and teaching environment sets up and follows clear and transparent processes, which offers opportunities for professional development of teaching staff throughout encourages scholarly activity. It reflects in strengthening the link between education and

research, also encourages innovation in teaching methods and the use of IT technologies like e-learning (The European Commission, 2002; Pasanec Preprotić, 2017).

This paper presents students as subjects of educational process, who actively participates in evaluation with their comments and suggestions, which can stimulate the teacher to improve all phases of teaching process. The evaluation of collaborative teaching process directly contributes improving quality of active teaching process. Students are giving a critical review about teaching performance what is very important for achieving course-learning outcomes. Thus, the aim of the research is to establish the existence of a significant difference in theoretical or practical teaching based on the principle of collaborative learning in a different learning environment.

2. New Methodical Approach to the Teaching of Bookbinding in Graphic Technology

Learning framework for Bookbinding course was developed with input from teachers, education experts and business leaders to define and illustrate the skills and knowledge, which students need to succeed in work, life and citizenship, as well as the support system for learning outcomes. This is critical teaching system which directly ensures teacher development using adequate learning environment (ERR framework, Merlin e-learning platform). Personal skills, content knowledge and important expertise, which they will need at Faculty, on the job and generally in life, students achieve better when they are actively engaged in solving meaningful problems. All of this can be provided with active learning processes through enhancing student-centered learning approaches, collaborative and participative forms of teaching and learning. Dialog, writing and "high-order thinking" have significant importance, which directly improve communicative learning processes, including social network model of thinking. That process involves focusing on achieving a particular prior learning outcome (previous courses) and resolution comprehension of all aspects of the bookbinding issue including bookbinding-learning outcomes (Budimir et al., 2014).

The graphic discipline includes mass communication that involves creation, production, management and distribution of advertising, marketing, web sites, books, magazines, newspapers, catalogues, packages and other media in printed and digital form. Graphic engineering is the part of technology field that requires the application of scientific and engineering knowledge and methods combined with technical skills in support of engineering activities (Kipphan, 2001). Bookbinding course is relate to design and production of traditional books, classified by content, binding type and binding form. Every book product is usually made of book block as a carrier of printed information and cover as protection unit, produced independently and then assembled into a single unique product. To analyze the organization of the production process it is useful to structure the bookbinding finishing processes into individual process sections. Each section characterizes the transformation of the materials with regard to the desired processing outcome. The designations of these process sections use unique terminology including classification in bookbinding (Kipphan, 2001, p. 776). The frame of bookbinding engineering contributes to student engagement and comprehension of a complex network of binding technology as well as a one-man craft bookbinding (Pasanec Preprotić, 2014; Preprotić et al., 2014; Dasović et al., 2015). The course follows finishing processes

throughout publishing and craft bookbinding. It studies the bookbinding processes and binding block system types. It focuses on determination of bookbinding characteristics regard to book shelfs system, binding unit, adhesive and paper type. The aim of the Bookbinding course is to find the best solution within available bookbinding engineering frameworks. Practical lessons are focused on specific details, including individual handmade books, which allow students to understand a complex binding technology network. Course topics support student engineering activities with integrated education environment and interdisciplinary approach to learning that provides hands-on a relevant learning experience for students. Students are working on real current bookbinding problems, which help them to develop critical thinking, student-learning habits and to grow individually. Thus, students` practical skills, explanations and conclusions are becoming measurable. In collaborative teaching process, students are able to think deeply, with critical thinking integrated into student activities. Vizek (2009) showed that Bloom classification (Figure 2) of cognitive domain active verbs provide active learning process throughout teaching method ERR framework system (Terzić, 2012; Dijanic, 2012). Students are relying on prior learning outcomes to develop complex levels of understanding (Pasanec Preprotić, 2017).

Figure 2. Teaching method based on Bloom classification

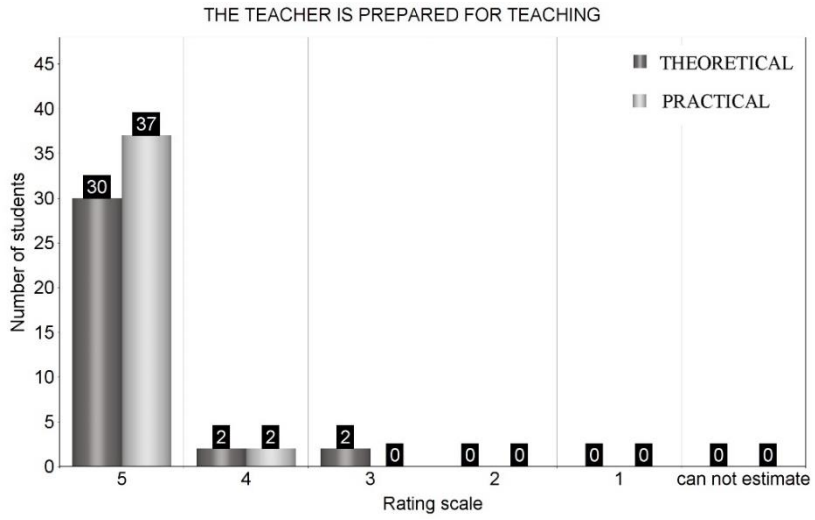
3.Results and discussion

Bookbinding course is an obligatory course in the last, 6th semester, for Bachelors of Science at Faculty of Graphic Arts, Technical – technological program. In academic year 2016/2017, 48 students attended the course frequently, and with support of the Information system of higher education institutions of Croatia (ISVU), during the last (15th) course week, 34 of them were involved in evaluation process of theoretical and 39 for evaluation of practical lessons. Evaluation sheet, which is questionnaire for improving the teaching processes, consists different groups of questions – about students' presence, compatibility of theoretical and practical lessons, students` interest in course and teacher performing quality. At the end of evaluation sheet, students gave remarks and suggestions for improvement of teacher work and

pointed at least three learning outcomes (practical knowledge and graphic engineering competencies). Students` responses were anonymous and expressed their personal opinions about the collaborative teaching process quality.

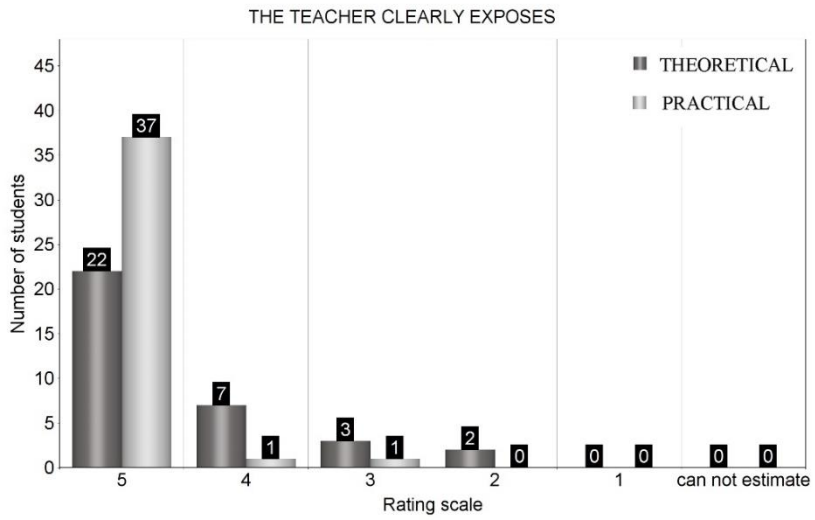
Research results are presented separate for theoretical and practical lectures. Practical classes students attended in small groups (8-10 students) in working-friendly environment (Bahr, 2010). Theoretical classes were performed in ex-cathedra style lecture hall, which did not leave impression of collaborative teaching process (Divjak, 2005). Results of evaluation sheet showed that students really like the concept of collaborative teaching process. On Graphs 1-9 results of evaluation sheet related to teacher performing quality are presented, as one of the most important group of questions for this research. For this group of questions, students used psychometric Likert rating scale (from 5 to 1) for teacher evaluation, in order to express their opinion, i.e. to agree or disagree with the offered assertions (strongly agree - agree – neutral – disagree – strongly disagree; or can not estimate).

Graph 1 shows the results related to teacher preparedness. There are no significant changes in the results for theoretical and practical part of course.

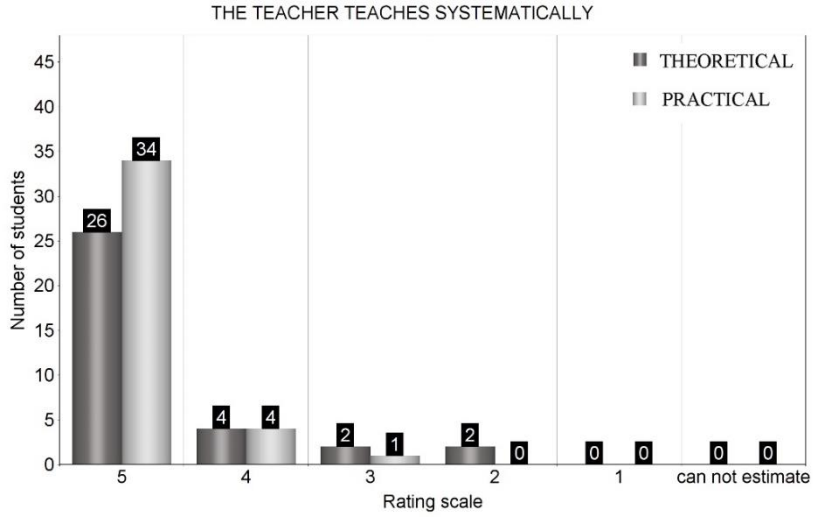


Graph 1. The results of teacher preparedness

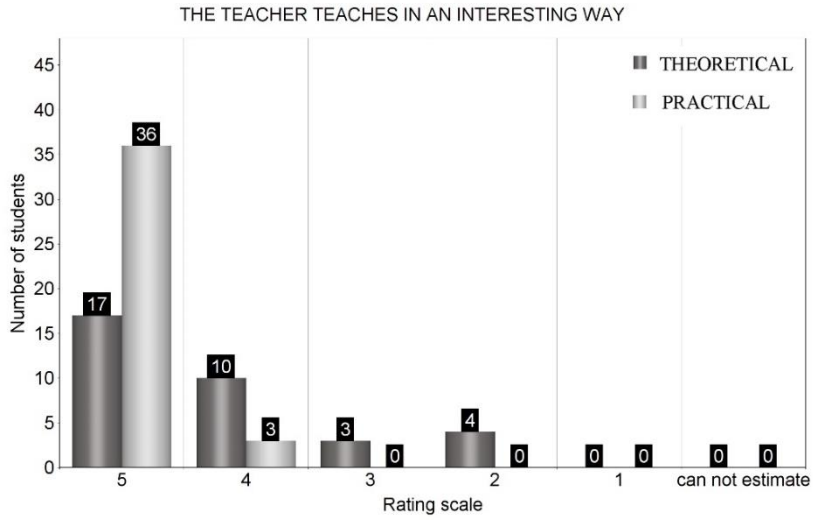
On Graphs 2-7 slightly more significant differences in theoretical and practical results are visible. The results showed slightly lower rating for theoretical part of course. These results are a reflection of teachers' inability to devote to each students' needs individually during theoretical lectures.



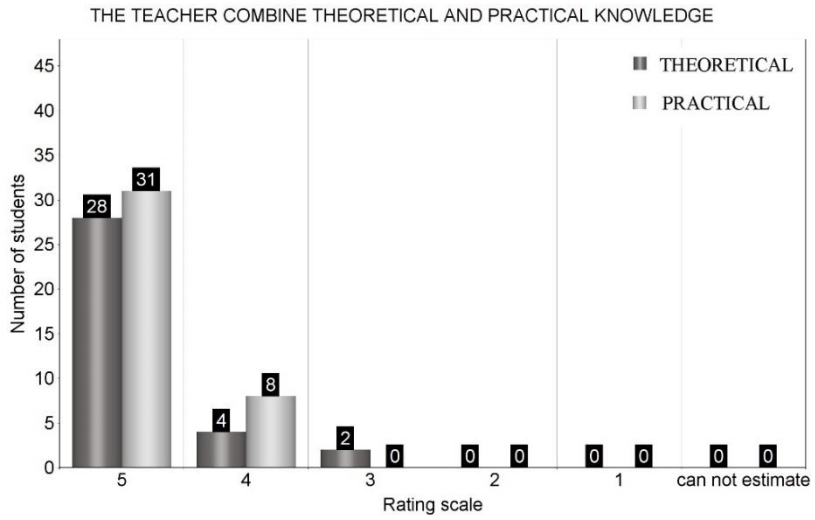
Graph 2. The results of teacher clarity



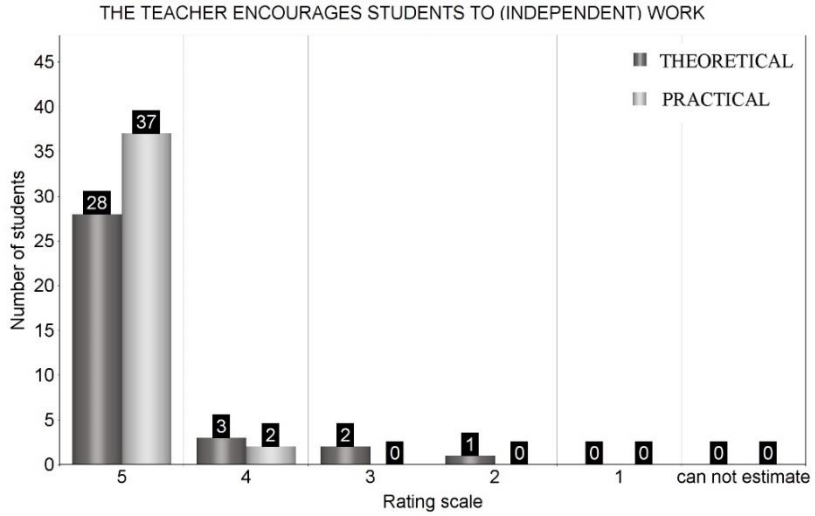
Graph 3. The results of teacher systematic approach



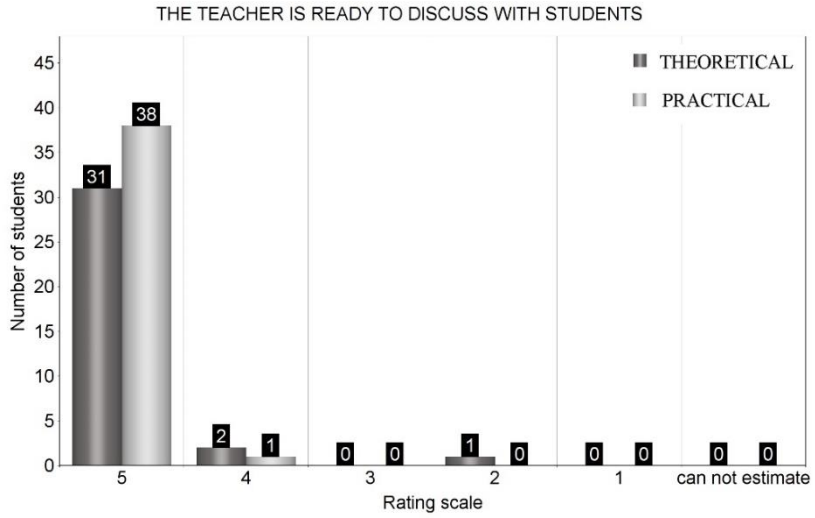
Graph 4. The results of teacher teaching style



Graph 5. The results of teacher ability to combine theoretical and practical knowledge



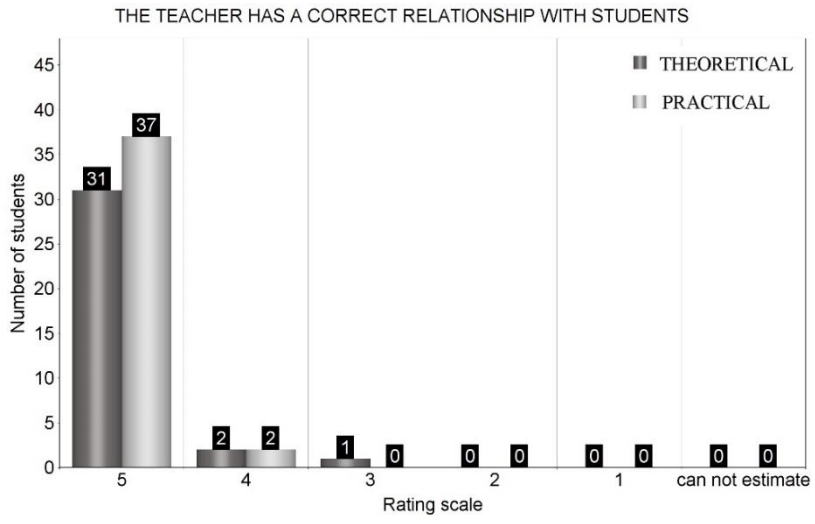
Graph 6. The results of teacher ability to encourage students to work



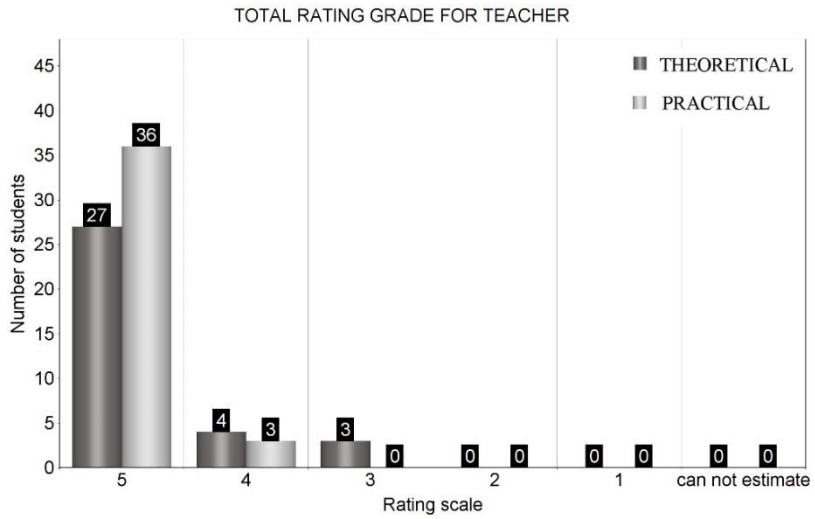
Graph 7. The results of teacher readiness to discuss

Apart from the fact that those theoretical lectures are performed for a large number of students at the same time, the mainly reason for lower rating is students' inability to connect prior and new learning outcomes. Because lack of knowledge, students are not able to think critically and cannot contribute to active learning process. Bookbinding course content summarizes different learning outcomes from other courses from 2nd to 5th semester and requires an engineering approach. Solving bookbinding course tasks based on graphic engineering approach is only possible with certain knowledge about graphic materials (type of paper, choice of adhesives) and book products design with bookbinding technologies implementation. Although teaching process for both type of course insists on inclusion of students through different types of activities and exercises (Divjak, 2009; Biggs and Tang, 2011) like tests, quizzes, funny stories and articles, in practice part of course students participate in personalized unique social game that includes Bloom classification, designed for large number of practical lessons in Bookbinding course (author: Gorana Petković, 2016). In addition, students are creating mental maps (2 - 4 students in group), discuss and resolve problems in small groups and learn in friendly working environment. Unfortunately, it is difficult to achieve the friendly working atmosphere in strictly defined theoretical environment, despite the implementation of active learning process. However, considering an excellent rating for all question types for practical lectures, the collaborative teaching process proved to be the right choice.

Students like friendly and relaxed working environment, where teacher respects and listens students' desires and needs. That is base for success in collaborate teaching process. Respect for students in teaching process has a strong positive influence on students desire to be more successful in professional and private life (Graph 8). Students like to be a part of collaborative teaching process, and despite all problems and difficulties of learning, at the end, they are satisfied with their teachers (Graph 9). The total average teacher grade, based on the responses to the above-mentioned assertions, is 4.66 for theoretical and 4.89 for practical lessons.

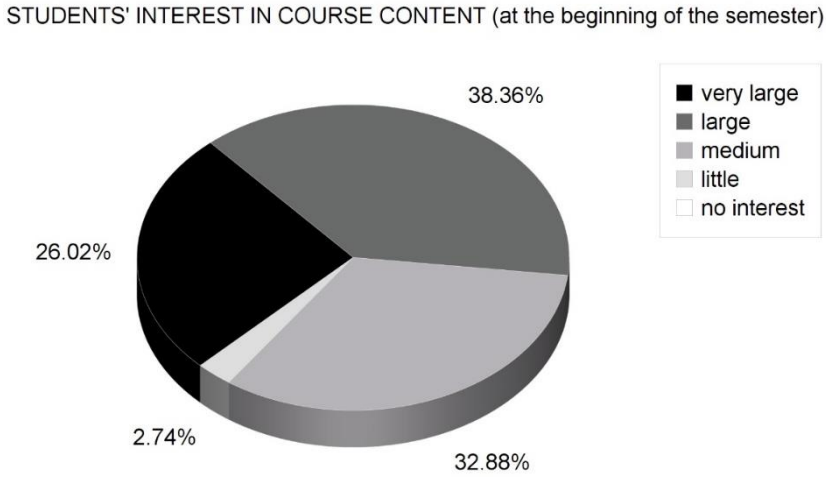


Graph 8. The results of teacher attitude toward students

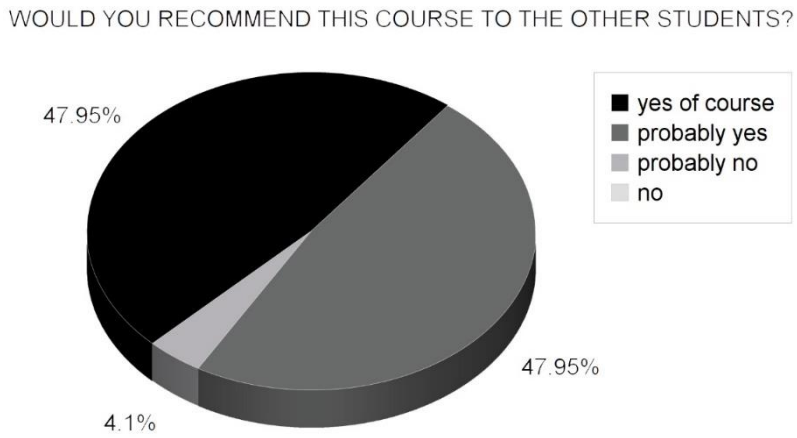


Graph 9. Total rating grade for teacher according to surveyed students

The evaluation questionnaire gave insight into some other data and information too. 90% of students were present at 80-100% of lectures, regardless of whether it is theoretical or practical part of course. 94,5 % of students think that consistency of the theoretical and practical part of course is harmonized or very harmonized. Also, 94,5% think that the coverage of the presented and given literature is excellent or sufficient.



Graph 10. Interest in course content at the beginning of Bookbinding course



Graph 11. Interest in course content at the end of Bookbinding course

Some interesting results are presented within the Graphs 10 and 11. They give insight into students' interest in course content at the beginning (Graph 10) and at the end (Graph 11) of Bookbinding course. At the beginning, only 64% of students had large or very large interest in Bookbinding course, but at the end, 96% of them would recommend this course to the other students. This is possible the greatest confirmation of teachers' good work and the quality of collaborative teaching process methods.

The last two groups of questions were open essay type, which concerned remarks and suggestion for improvement of teacher performance and achieved learning outcomes. Here are some students' comments and suggestions for course teachers*: "No comment, just keep going…!"; "All is great!"; "Be a little tighter!"; "I like group discussion and encouragement to the practical work. The classroom is too small."; "I have no comment. If students follow the teacher, all course topics and tasks are understandable"; "The way you teach is great!"; "It is refreshment. Lessons are a well conceived and interesting! Congratulation on quality and well-prepared teaching, good course content and materials design. We can connect the knowledge we gained on other courses with new ones!"; "Lectures are interesting and interactive."; "The professor is extremely trying to explain the matter and she succeeded it!"; "Give us less tasks (mental maps, quizzes, knowledge tests including prior learning outcomes)!"* and *"Give students more literature on Merlin's IT platform"*. From achieved learning outcomes, students have mentioned these: *"The designing of book product is deeply understood. Also, we are able to differentiate machines and tools for specific book production."; "I am able to create my own book and I understand how to make book in specific circumstances."; "I have learnt to think and solve problems on different way."; "I know how to prepare a book product for publication."; " I know how to classify book by its essential self-life parameters."; "We learn a lot about materials related to book production and graphic industry in general."; "Now, I can easily connect my theoretical and practical skills."; "I am able to select all graphic materials for particular book type."; "I recently visited a printing company and I recognized all machines because of this course. I saw a lot of pictures and videos of them during the course and I knew how they work."; "I realized how it is important to learn continually, and how much benefits it brings:)"; "I can suggest a paper type, binding form, materials and machines in bookbinding production or for particular product according to desired book features."; "I can understand and connect standardized and practical bookbinding terminology."; "I am able to choose the format for particular book product, make a good selection of book binding materials and I have enough practical knowledge to make handmade book."* and *"Finally, I am able to connect knowledge from different courses!"*.

4.Conclusion

Evaluation of teaching process, at the end of Bookbinding course, was carried out through questionnaire sheet for each student individually. Obtained result showed that most students prefer collaborative teaching method for many reasons. One of the main reason is that teacher is able to present topics, knowledge and personal skills from a labor market in very simple, attractive and interactive way. Students enjoy learning in small groups and teacher have to find a way, for students, to be active members in learning process through the whole semester, on every theoretical or practical lesson. Students appreciate structured, organized and

up to date course content and lectures, which can be a main initiator for theirs continuous learning, and finally the main reason for higher grades. Also, students need to know their tasks and teacher's expectations in advance, as well as evaluation criteria. It is very important to constantly repeat and connect new knowledge with previously acquired learning outcomes, as well as implement them in given practical tasks. Teacher have to encourage students on sharing knowledge and experiences between them through critical discussions, although it is very hard to include every student to be an active member. This can only be achieved in friendly working atmosphere, with informal conversations, which is easier to achieve during practical lessons. When students start to contribute to teaching process alone, teacher have to take a role of moderator. The collaborative teaching process requires investment in teacher scientific and practical long-life education. Thus, systematic teaching competence development has to become a part of higher education strategy (Garet et. al. 2001; Lončar-Vicković and Dolaček-Alduk, 2009; Bilić et al., 2016). It is especially significant for interdisciplinary fields and creative industries, such as graphic engineering and graphic industry. After the end of every teaching process, it is necessary to receive feedback from all participants to keep working on improvement of teaching process quality.

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Annex

Evaluacijski list

Sveučilište u Zagrebu, Grafički fakultet, Getaldićeva 2

Studij: *Preddiplomski studij grafičke tehnologije* ***Akademska godina:*** *2015. / 2016.*

Kolegij: *Knjigoveštvo 1*

Nastavnik kojeg ocjenjujete (ime i prezime): _____

Vrsta nastave (predavanja, seminari ili vježbe): _____

Ovim upitnikom možete utjecati na poboljšanje nastave te upozoriti na nedostatke i teškoće u njezinoj izvedbi. Želimo da vaši odgovori budu iskreni, dobronamjerni te da izražavaju Vaše osobno mišljenje. Anonimnim odgovorima zajamčena je tajnost Vašeg mišljenja. Kako bi upitnik bio ispravan, molimo Vas da odabrane odgovore označite sa ☒:

Vaša prisutnost predavanjima?

☐ 80-100% ☐ 60-80% ☐ 40-60% ☐ neredovita

Usklađenost predavanja i praktičnog dijela nastave?

☐ vrlo velika ☐ velika ☐ osrednja ☐ mala ☐ nikakva

Vaša zanimanje za ovaj kolegij?

☐ vrlo velika ☐ velika ☐ osrednja ☐ mala ☐ nikakva

Molim Vas da ocijenite izvoditelja kolegija prema priloženim obilježjima:

Pripremljenost za nastavu	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1	☐ ne mogu ocijeniti
Jasno izlaže	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1	☐ ne mogu ocijeniti
Sustavno predaje	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1	☐ ne mogu ocijeniti
Predaje na zanimljiv način	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1	☐ ne mogu ocijeniti
Povezuje teoretsko i primijenjeno znanje	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1	☐ ne mogu ocijeniti
Potiče studente na (samostalan) rad	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1	☐ ne mogu ocijeniti
Spremno raspravlja sa studentima	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1	☐ ne mogu ocijeniti
Korektno se odnosi prema studentima	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1	☐ ne mogu ocijeniti
Ukupna ocjena	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1	☐ ne mogu ocijeniti

Da li je nastava održavana redovito i točno prema rasporedu?

☐ redovita i točna ☐ redovita sa zakašnjenjem ☐ neredovita ☐ izrazito neredovita

Pokrivenost gradiva literaturom?

☐ odlična ☐ dovoljna ☐ nedovoljna

Biste li ovaj kolegij preporučili drugim studentima?

☐ da, svakako ☐ vjerojatno da ☐ vjerojatno ne ☐ ne, nikako

Molimo da svoje dodatne primjedbe, zapažanja i prijedloge za poboljšanje rada navedete na poleđini ovog lista.

Hvala Vam na pomoći i suradnji!

Figure 3. Questionnaire form (front side)

Primjedbe i prijedlozi za poboljšanje rada nastavnika:

_____

_____

_____

_____

_____

Navedite najmanje 3 ishoda učenja (praktična znanja/kompetencije koja imate iz grafičke struke) nakon odslušanog kolegija:

1. _____

_____

_____

_____

2. _____

_____

_____

_____

3. _____

_____

_____

_____

4. _____

_____

_____

_____

Figure 4. Questionnaire form (back side)