

Project-based and Collaborative Learning Approach in Data Journalism Classes for College University Students

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Keywords: Data Journalism, Collaborative Learning, Experiential Learning, Educational Strategy.

Abstract. This article describes ongoing data journalism education's action research in Universitas Multimedia Nusantara (UMN). Data journalism has become an increasingly needed skill to offset the tendency of reporting that relies solely on people's statements. However, formal training at the university level on this subject is almost non-existent. UMN tried to pioneer data journalism training for journalistic students. The implementation of these courses in the journalism education curriculum at the same time becomes action research to explore appropriate training and education methods on this subject. In this data journalism course tested two approaches strategies, namely collaborative learning and experiential project-based learning. Several teaching team members, college participants, and data journalism practitioners were interviewed and discussed in the focus group discussion forum to provide evaluations and insights regarding the implementation of data journalism courses with the two mentioned approaches above.

1 INTRODUCTION

Aliansi Jurnalis Independen (AJI) states that data journalism is an important skill, and quite a lot of journalists need this skill (Astuti, 2019). The development of data journalism in Indonesia can be said to be slower compared to European and American countries. Media such as The New York Times in the United States and The Guardian in the UK have previously produced editorial projects involving the use of large datasets and impressive data visualization (Splendor et al., 2016). Along with the increasing role of data journalism for the news industry, the need for data journalism skills training has also increased.

Splendor et al. (2016) state that in Europe, such training can be held by three sources, namely academic, vocational education, and professional institutions. Meanwhile, in Indonesia itself, based on pre-research observations, shows that such training is still minimal. AJI, as a professional journalist association, organizes training aimed explicitly at practitioners. From the academic world, there are at least two universities that hold data journalism training as part of the curriculum. The two universities are Multimedia Nusantara University and the University of Indonesia. In addition to the

two Universities, Gajah Mada University also began exploring this field through extra-curricular activities. Other parties who participated in conducting data journalism training were the Indonesian Journocoders community.

The field of data journalism expertise is indeed entirely new. Therefore it is not surprising that this field has not yet been included in the journalistic education curriculum in universities. However, at least 25 universities around the world offer degrees or special programs dedicated to data journalism (Vallance-Jones and McKie, 2017). Several journalistic higher education programs in the United States include training in data journalism in their curriculum. However, few provide advanced skills training, which provides expertise in usage spreadsheets, statistical software, relational databases, or programming (Berret and Phillips, 2016).

The entry of subjects in data journalism training in the journalistic higher education curriculum has some obstacles. One of the essential things is the area of mathematics, statistics and programming is not a common thing in journalistic study programs ((Berret and Phillips, 2016)Barret & Phillips, 2016; (Splendor et al., 2016)Splendor et al., 2016; (Davies and Cullen, 2016)Davies & Cullen, 2016). This research is action research where the challenges in

conducting data journalism training for journalistic students will be answered through the implementation of training in particular subjects in the UMN Journalism Study Program through experiential and collaborative learning approaches.

2 THEORETICAL FRAMEWORKS

2.1 Data Journalism

The term data journalism has some definitions that are not the same (Davies and Cullen, 2016). Jones & McKie (2017) mention that data journalism is rooted in activities called "computer-assisted-reporting" (CAR). The rapid development of computer technology in the 80s made it easy for journalists to use software such as FoxPro and Microsoft Excel to read trends and patterns in government databases.

Berret & Phillips (2016) quotes a more practical definition of data journalism describes by Alexander Howard. Howard explains that "data journalism is gathering, cleaning, organizing, analyzing, visualizing, and publishing data to support the creation of acts of journalism." Data journalism is the application of data science in the field of journalism (Berret and Phillips, 2016). Meanwhile, Splendor et al. (2016) offer another definition of data journalism, " it is a matter of collecting, processing, analyzing, and essential data of information using computer technology." Although the term data journalism has a variety of definitions, there are several things that, in principle, the same. Data journalism is always associated with the development of computing technology, and journalist analyzes data through a statistical approach, then from the data, the journalist seeks for a storyline that has news value.

2.1.1 Data Journalism Education

The attention to education in data journalism throughout the world is increasing. However, some studies on data journalism training indicate a similar problem, namely; who will teach, the difficulties in meeting demands of technical expertise and statistics, and how to attract students who are not familiar with the concept of data journalism (Mair et al., 2017) (Alves et al., 2014).

As part of data science, data journalism training needs to reach three main areas of expertise, namely, journalism as the primary domain, applied mathematics (statistics), as well as coding and

programming. The demands of the second and third mastery of expertise usually become obstacles because, as Berret & Phillips (2016) say, journalistic schools and their practitioners tend to avoid quantitative skills training.

Charles Berret & Cheryl Phillips (2016) offer five curriculum models that universities can use as a data journalism education strategy. The first two models are more suitable when applied to the level of undergraduate education, while the other three models are more flexible can be used both at the level of undergraduate and graduate (Heravi, 2019).

The first model, Integrating data journalism as a core class. This model put a data journalism course as a part of the core curriculum of journalistic education at the undergraduate level. The course serves as a basic introduction to data and computing journalism skills (Heravi, 2019).

The second model is in the form of integrating data and computation subjects into existing courses and concentrations. The implementation of this model is to insert discussions related to data journalism and computation in pre-existing classes. The analysis of data journalism is broken down and disseminated in various subjects that are considered relevant to each discussion (Heravi, 2019).

The third model put data & computational journalism course as a concentration program that is part of a journalistic study. Students were choosing several elective courses that have been prepared to achieve specific expertise in the field of data journalism (Heravi, 2019).

The fourth model is for the graduate degree level in journalism. This model is intended for journalistic practitioners who want to learn new particular skills in data and computational journalism. Participants who already have an understanding and experience as a journalistic practitioner can be directed to achieve a level of expertise that is more focused and in-depth compared to if the students come from undergraduate programs (Heravi, 2019).

The fifth model, in principle, is to insert the theme of data and computational journalism as part of the graduate degree program with specific emerging journalistic techniques and technologies. Programs like this are a vehicle for exploring new approaches and technologies in the field of journalism, and for now, data, computational journalism, machine learning, drones, and virtual reality are still areas of study that need to be explored further (Heravi, 2019).

This action research examines the first model, namely by developing a specialized course that teaches conceptual understanding and mastery of

essential technical skills in data journalism. This course has been going on for two years.

2.2 Learning Model

2.2.1 Collaborative Learning

Collaborative learning is a learning approach that focuses on the collective knowledge and thinking. Through this approach, students have to deal with problems and assignments to real-world problem-solving. This kind of learning strategy requires effective communication between students, lecturers, and other relevant parties.

The collaborative classroom has four general characteristics. The first two characteristics are related to changes in relations between lecturers and students. The third characteristic describes a new approach for lecturers in giving instructions. Fourth, discuss the collaborative composition of the classroom. The four components are:

1. Shared knowledge among teachers and students
2. Shared authority among teachers and students
3. Teachers as mediators
4. Heterogenous grouping of students

The collaborative learning approach demands changes in instruction from traditional patterns to patterns of education that are suitable for this approach. Changes like this have some challenges that must be considered.

Those challenges are:

1. Classroom control. Collaborative classroom tends to be more crowded than traditional classes.
2. Preparation time for collaborative learning. Lesson plans need to be made but must accommodate flexibility to build the desired collaboration.
3. Individual differences among students. This difference can be useful for collaboration, but it also has potential problems when the difference lies in the gap in expertise and motivation.
4. Individual responsibility for learning. The traditional pattern of relying on its own assessment while on the collaborative classroom is complicated. Participants need a sense of personal responsibility for self-development rather than just pursuing value.

5. Conflict values. Collaboration requires a lot of communication and discussion. The potential for conflict arises when there are differences in personal values between students and lecturers involved.

2.2.2 Experiential Learning

Clark in Burns (2017) states, "the experiential learning has a deserved place in journalism education." The underpinning concept of experiential learning is mostly "learning by doing." Students gain knowledge and understanding through a reflective process of experience (Mair et al., 2017).

Experiential learning strategies contain four stages of the process, namely; (1) concrete experience, (2) reflective observation, (3) abstract conceptualization, and (4) active experimentation (Mair et al., 2017).

Burns (2017) also proposed that experiential learning be combined with Team-Based Learning (TBL). This TBL model is a method of learning and teaching based on "small group interaction" (Mair et al., 2017). This approach has four fundamental principles: (1) adequately formed and managed groups; (2) accountability for quality of students' work; (3) frequent and timely feedback; and (4) group assignment to promote learning and team development (Stein, et all in Burns, 2017) (Mair et al., 2017).

3 METHODOLOGY

3.1 Research Approach and Design

Brydon-Miller, Greenwood, and Maguire (2003) state that action research is participatory research, where researchers are an active member of the process or action under study. Meanwhile, Ivankova and Winggo (2018) stated that action research is "a cross-disciplinary methodological approach that focuses on learning about practical issues to improve or change them."

This paper is written based on the action research approach, where the author is a part of a team who designs, implement, and evaluate the Interactive Data Journalism course at Universitas Multimedia Nusantara.

In this research, the author use document study and in-depth interview as data collection techniques. The documents referred to in this research are course assignments, midterm results, final semester exam

results, and other documents relating to this course — more in-depth information gathered by interviewing several informants.

3.2 Informants

The three categories of informants interviewed were

1. Journalistic students were participating in the Interactive Data Journalism course in the Journalistic Study Program, Multimedia Nusantara University.
2. Teaching lecturers in the Interactive Data Journalism course in the Journalistic Study Program, Multimedia Nusantara University
3. Data journalist practitioners involve as mentors and guest lecturers in the Interactive Data Journalism course, Multimedia Nusantara University.

3.3 Data Analysis Techniques

The purpose of action research is to learn practical issues by doing and analyze the process in order to improve or change them. In this case, the problem is the implementation of the Interactive Data Journalism course at the college level through a collaborative approach and experience-based learning.

The data obtained becomes material for evaluative analysis. The learning process occurs compared to student achievement in mastering the ability of data journalism, which includes "gathering, cleaning, organizing, analyzing, visualizing, and publishing data to support the creation of acts of journalism."

The score and quality of student work in assignments and examinations are indicators of achievement, while in-depth interviews try to find out what is right and what needs to improve in the learning process.

4 RESULT AND DISCUSSION

The Interactive Data Journalism subject course consists of 14 face-to-face class meetings, one midterm exam, and one final exam. Participants of this course work in groups of a maximum of 5 members. The five members have their respective roles, which include: News Producer, Data Journalist, Data Visualizer, and Researcher & Writer. Except for the role of the News Producer,

two students can pick the same roles if they think it is necessary.

During the first seven meetings, all groups were given skills training to search, clean, analyze, visualize, and write a data-driven story. The midterm test then measured the results of the training. Each student was asked to complete a mission-based data-driven journalism project using and the data provided. At this stage, each student must be able to demonstrate the skill of cleaning data, analyzing, making visualization, and finding patterns of data that can be a focus of data-based stories.

Entering the 8th meeting, participants began working intensively in groups to work on data-based journalism projects. The teams must submit the completed final assignment at the 13th and 14th meetings. The final project begins with a public lecture given by a journalist from beritagar.id. This public lecture provides an overview of the best practice process of data journalism in the real world. Then the guest lecturer gave several project themes that had real news value to be done by existing groups.

Of the seven classes of this course, 4 of the best proposals were chosen to get mentoring/mentoring from news journalists in the process of completing their final project.

There are three checkpoints to test the mastery of student's data journalism skills. The first checkpoint is the midterm exam. Students are given several 2018 DKI Jakarta APBD datasets, and they must build a data-driven story based on those datasets. The DKI Jakarta APBD dataset and the intended realization consists of 13 files, and each contains around 50,000 rows of data, they can choose how many datasets need to be used. Scoring is given based on each stage of data journalism workflow, from cleaning to writing the story. At this checkpoint, the average score of students from 226 participants was 60. The highest score was 95, while the lowest score of test participants was 5. There are several challenges that students have during the exam. Students were not familiar with the issue, so it requires quite a lot of time to study it before they can get the story idea. Students have difficulty analyzing an extensive dataset while the software used is still limited to Microsoft excel. The other factor is technical errors in the laboratory used for this exam.

Overall there are some critical findings related to obstacles faced by students in the learning process of data journalism in a collaborative and project-based manner. These findings are:

1. Students, lecturers, and mentors agree that the most critical and problematic skills are finding and developing story ideas.
2. Students have difficulty finding the right dataset due to lack of understanding of the issue and location of relevant data sources.
3. Another challenge is the weak statistical ability and mastery of computer software that makes data processing easier.
4. Learning motivation is not the same.
5. The assumption that mathematics (statistics) and programming (coding) are outside the realm of journalism
6. The previous learning culture becomes an obstacle in sharing knowledge and authority process among students and lecturers.
7. Mentors and real-world problems to solve are still lacking.
8. Learning new skills that are quite complex becomes more manageable when done with a team with varied abilities.
9. The side effect of this experiential and collaborative learning approach is an opportunity for shaping students' soft-skill in collaborative problem-solving.

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