

# An Analysis of Data Journalism Classroom: Challenges and Opportunities

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## Abstract

This paper details the classroom experience of recently introduced data journalism elective course at University of Calicut. It examines the factors that influence journalism students' decisions to pursue this course, as well as the difficulties instructors face during the preparation and teaching stages. Two questionnaire surveys were undertaken, the first before the course to explore student expectations and concerns about the subject, and the second to collect student feedback. It also discusses how to improve the data journalism course.

## Keywords

Data journalism education, Computational journalism, Data visualisation

## Introduction

Despite being a nebulous term (Lewis, 2021), data journalism is thriving in newsrooms, and its newsroom and academic trends have reached India. The growth of data journalism is dependent on multiple disciplines including social sciences, data and computer sciences, data analytics, information design and communication (Heravi, 2019). While journalistic values remains as its core, what sets data journalism apart is the new kind of information sourcing and storytelling practices in form of computational data analytics and data visualisation. This shift from traditional practices presents challenges not only for the journalists but also for the journalism educators (Kashyap & Bhaskaran, 2020). The requirements include better data literacy to use both public and private databases, as well as robust digital literacy to use web 2.0 technologies (Flew et al., 2012).

The emergence of data journalism in India was gradual, but both traditional media outlets (such as The Hindu, The Indian Express, Hindustan Times, etc.) and digital news outlets (such as India Spend, Mint, and Factly) quickly

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realised the potential of data-driven storytelling. Some initiatives were recognised internationally (India Spend received a "honourable mention" in Data Journalism awards in 2016 and Hindustan Times won awards at the Malofiej International Infographics Awards in 2016), while others went on to collaborate with international players for data-driven investigations (Indian Express worked on the "Panama Papers" project). But still there are some intrinsic and extrinsic factors hampering the development of the field in India. Intrinsic factors include the smaller size of the data journalism team and the inability to create interactive visualisations and the extrinsic factors include the availability of data, hesitation of government officials to provide data, and the delay in making data available to the public (Kashyap et al., 2020). Kashyap et al. (2020) also points out that some news organisations are creating a problematic situation of "data for the sake of data" by using minimal data visualisations with data aggregates as the source which takes the investigative side out of the data journalism.

Journalism schools face similar problems in teaching data journalism. Although the first step towards offering data journalism courses has been made, lack of teachers with expertise in data turned out as a major problem (Davies & Cullen, 2016; Lewis, 2021). The vague definition of data journalism itself is causing confusion among educators, which sparked a discussion about what should be covered in the curriculum - whether to include web design techniques, coding, and if included, does it require the instructors from the journalism background. Scholars have also looked into the issue of journalism students' math aversion as a challenge for data journalism education (Davies & Cullen, 2016; Green, 2018).

To move away from "data for the sake of data" and towards data-based investigative journalism, newsrooms in India must undergo a transformation. For this, newsrooms requires journalists who are proficient with data and have a strong technical foundation (Kashyap & Bhaskaran, 2020). This also point to a need for a development in data journalism pedagogy. It's also an opportunity for journalism programmes to positively impact the media industry by graduating future journalists who are proficient in data journalism.

Scholarly works are emerging in the data journalism teaching, student experience and curriculum. However, the majority of them come from places like the United States, Europe, Australia, and Hong Kong. Kashyap and Bhaskaran (2020) in their notable work call for case studies from India regarding data journalism education and how it's different from that of other countries. This research is based on the teacher and student experience of data journalism course on its introduction for second-year post-graduate students at the University of Calicut in Kerala. Data journalism was one of the three

electives offered for the fourth semester journalism students. Students had to take two out of the three electives. While outlining the challenges, this paper also explores solutions using existing models for teaching data journalism.

### **Data journalism elective course**

There are 5 modules in the data journalism elective course, MCJ 403. The introduction module covers the history of data journalism, computer assisted reporting, precision journalism, data literacy, and data journalism initiatives from India and around the world. The second module covers developing a data story, various data sources, and data sourcing techniques. The third module is about creating insights from data and the fourth module is about data visualisation. Third module was also covering portions regarding quantitative literacy – basic statistics, simple calculations and the verification of data. Module two to five also include the practical training of data journalism tools. The course plan is prepared in such a way that theory class and practical class are alternated. Tools introduced to students as part of the practical training were MS Excel, Google Sheet, Tabula, Table Capture, Flourish and Data Wrapper.

### **Objectives of the study**

1. To explore the factors that influenced students' decision to opt for data journalism elective course.
2. To review the student attitude towards data journalism after the course.
3. To analyse the challenges in teaching data journalism.
4. To discuss the changes that can be implemented in the data journalism classroom.

### **Methodology**

Two online questionnaire surveys were conducted to find out what students thought of the data journalism elective course before and after the course. Both the first (S1) and second (S2) questionnaire surveys were conducted in the months of 2022, with the S1 taking place in June and the S2 in August. 18 of the 21 enrolled students in the course completed both surveys. Questionnaire consisted both closed-ended and open-ended questions.

The S1 asked questions to determine why students chose data journalism as an elective, their attitude towards mathematics and their familiarity with data management and tools. Two of the 15 questions were open-ended, and the rest were closed-ended. S1 was administered after a one-hour introductory class of the course. S2 was conducted after the last class of the course consisted of 16 questions. One of these was an open-ended question. The main content of the questions in this survey were to study students' attitude towards data journalism after the course, their confidence in data journalism skills and suggestions for improving the course.

Due to the small sample size, the survey responses are presented as raw data in the findings part. Students' responses to open-ended questions were coded and analysed using the 'Taguette' qualitative data analysis tool. The responses were read and reread and identified major themes in each set of responses. Quotes from the responses that support each theme was organised accordingly. A table for each question with the themes and number of supported quotes was created. The discussion is based on this data.

### **Findings of S1**

The 21 students who chose the data journalism course were all female. The 18 survey participants all had backgrounds in the humanities and arts. Therefore, these data are not useful for determining how individuals from various backgrounds perceive the data journalism course.

#### ***The decision to opt data journalism***

When asked which elective was their first preference only 6 answered data journalism (Table 1).

**Table 1**

*Names of electives offered and number of students opted as their first preference*

Question	Response	Frequency
Out of the electives provided, which was your first choice?	Data journalism	6
	Photo journalism	12
	Political economy of Indian media	0

Only 5 students (agree – 4, strongly agree – 1) indicated that they would have taken data journalism even if some additional electives had been offered (Table 2). 8 students out of 18 thought choosing data journalism as an elective was an easy decision, while 2 disagreed (Table 2).

**Table 2**

*Preference for data journalism and difficulty in opting data journalism*

Question	Response				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Even if I had other options, I would have taken Data Journalism as one of my elective	2	6	5	4	1
Selecting Data Journalism as an elective was an easy decision for me.	0	2	8	7	1

There was an open-ended question about the motivation for selecting data journalism as an elective. The responses were coded and divided into five themes. Interestingly, 6 responses indicated that taking data journalism was a result of the lack of elective options. Also, students believe that studying data journalism will lead to better job opportunities and careers in journalism (6 supporting statements). Three of the statements show that taking the data journalism elective was motivated by an interest in statistics, data, mathematics, and data visualisation. Other themes identified were ‘interest in studying a new area’, and ‘scope of the subject’ (Table 3).

Responses to another open-ended question indicates that most students had no concerns about choosing data journalism. Themes identified from the responses and frequency of each theme is given in Table 4. Some people expressed concern that statistics and math might play a significant role in data journalism (2 supporting responses), and that the practical content of the curriculum would be challenging to learn (3 supporting responses). Another theme identified was whether data journalism could be studied in a condensed semester given the time constraints (1 supporting response) (Table 4).

**Table 3**

*Motivation for selecting data journalism as elective, themes identified and frequency of supporting statements*

<b>Themes of Responses</b>	<b>Frequency</b>
Career or Job prospect	6
Interest in studying a new area	5
Lack of other options	6
Interest in data analysis, visualization and interpretations	3
Scope of the subject	5

**Table 4**

*Concerns when choosing data journalism elective, themes identified and frequency of supporting statements*

Themes of Responses	Frequency
No concern	5
Concerns related to Mathematics and statistics	2
Concern related to limited time	1
Concerns related to practical content of the data journalism	3

12 respondents (agree -10, strongly agree – 2) considered their attitude towards mathematics as a factor in choosing data journalism (Table 5). 6 had ‘neutral’ experience to mathematics in school classes (Table 5).

**Table 5**

*Do the students considered their attitude towards mathematics while choosing data journalism and students’ experience of mathematics in school classes*

Question	Response				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I considered my attitude towards Mathematics while selecting the Data Journalism elective course	1	4	1	10	2
I did enjoy studying mathematics in school classes	4	1	6	3	4

### ***Prior experience in data journalism***

Only one out of 18 students had previously attended classes or workshops related to data journalism/data visualization. 11 had previously learned spreadsheet software. Of these, 10 were able to enter and visualize data in spreadsheet software. 8 students marked positive response (agree – 6, strongly agree – 2) to the statement ‘I do carefully read the data visualizations and infographics those are getting published in the news media’, 9 marked ‘neutral’.

### **Findings of S2**

#### ***Perception of the data journalism course***

Upon their completion of the data journalism course, 13 respondents said they felt more interested in the topic (12 - agree, 1 - strongly agree). 13 people responded positively to the claim that choosing the data journalism as the elective was the right decision (10-agree, 3 - strongly agree) (Table 6)

A Similar numbers of students responded positively (agree – 8, strongly agree – 4) to the statement ‘I think the data processing and data visualization skills I have studied will be useful in my career’ (Table 6). 16 out of 18 said that they would attend if more data journalism workshops or classes were provided.

### **Table 6**

*Interest in data journalism after the course and do students feel choosing data journalism elective was the right choice*

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
After attending data journalism elective, I feel more interested in the subject	1	1	3	12	1
I believe that choosing data journalism as an elective was the right choice.	1	0	4	10	3

**Table 7**

*Do students think the skill taught in the classroom will be useful in their career and do they feel more updated in the field of journalism?*

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I think the data processing and data visualization skills I have studied will be useful in my career	1	1	4	8	4
By attending the data journalism elective, I feel more updated in the field of journalism	1	1	4	9	3

### ***Data journalism skills***

14 out of 18 gave a positive response to the statement that they later practiced the skills taught in the data journalism class. (12 -agree, 2-strongly agree). Also they feel more confidence in basic statistics. But only half of the responses share the opinion that they are confident to analyse and visualize small or large data sets (agree – 8, strongly agree – 1). (Table 8)

**Table 8***Student responses after the course on data journalism skills*

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I had practiced the practical skills that were taught in the classroom	2	0	1	12	2
I am confident that I can analyse any dataset, be it small or large, and create visualizations.	1	4	4	8	1
After attending data journalism elective, I feel I have a better understanding of basic statistics	1	1	3	11	2

***Suggestions from students***

The question to provide suggestions to make the data journalism course better was open-ended. The responses were coded and placed into three themes. The need for more practical-oriented classes emerged as the main theme (10 supporting statements). More in-class discussions to stimulate interest in data journalism (2 supporting statements) and more theory classes (2 supporting statements) were the other two themes (Table 9).

**Table 9***Student suggestions to improve data journalism course , themes identified and frequency of supporting statements*

Theme	Frequency
More practical	10
Discussions to create more interest in the subject	2
More theory classes	2

### **Data Journalism Teaching Experience**

The first step to teaching data journalism was to create a course plan based on the syllabus. Course plan was designed in a way that theory and practical session would alternate. A challenge in preparing the course plan was not having an idea of how much time would be required to teach each of the data journalism tools. Because it was thought that the students would find the coding portion of the course challenging, it was decided not to include it in plan. The tools included in the course plan are Microsoft Excel, Google Sheets, Tabula (tool to extract tables from PDF files), Table Capture (a browser extension to scrape tables from websites), Flourish and Datawrapper (online data visualization tools). The sources (book section, websites, videos etc.) on which each theoretical and practical sessions based on was noted in the course plan. Before starting the classes, the course plan was sent to students via email.

The examples that were included in addition to the theory section made it easier for the students to understand the lessons being taught. In each class, two students were given the assignment to identify a data story, the data source of that story and the manner in which the data is presented, they had to present this before the starting of each session. It was intended to make students understand the basic concepts of data sourcing, data visualization, etc. This exercise was very effective. Some parts of the syllabus were difficult for students to relate to. It was later discovered that this was a drawback of the teaching strategy used; students were more effective when providing hands-on training during the theory portions. This method was adopted after the first two modules.

The students were divided into groups for hands-on activities, and then each group was given a task. For instance, the first task was to extract information about traffic accidents in Kerala from a set of PDF file that was taken from the website of Kerala Police, and use Excel to draw useful conclusions from it. Each group looked at various factors, including the time of the accident, the vehicle involved, and the frequency of accidents in each district. Different table format in each files were making this exercise more challenging. Also some variable were missing in some of the files. Another challenge here was that the hands-on sessions took longer to complete than expected. Some of the exercises were completed after class. Some students struggled to use the data journalism tools and needed more time to complete the practical. Some students lacked proficiency with computers. Despite their best efforts, they found it difficult to keep up with the group during activities. One of the difficulties encountered during the preparation stage for the practical sessions was deciding which data to choose for the student exercise. At the same time it should interest the students and should be workable data.

Limited internet access was another challenge. Most of the exercises were designed to scrape data from the Internet. But due to the low speed of the internet, the activities are often delayed. There was only limited time for the practical sessions of data visualisation. Students quickly mastered the use of fundamental data visualisations like bar charts, line charts, and pie charts. However, despite their enthusiasm for creating data visualisation, they failed to recognise the loss of data that results from using the incorrect technique. The instructor had to give students a detailed explanation of the context in which each chart would be used.. Crowdsourcing of data and collecting data using Right to Information Act were discussed in class but due to time constraints these could not be executed as practical exercises.

Despite many challenges, data journalism classroom experience helped the instructor in understanding the areas that required upskilling.

## **Discussion**

The first objective of this paper was to discover what factors influence students' decision to pursue data journalism as an elective. Only a few people chose data journalism as their first choice, and even fewer said they would have chosen it if other options had been available. This shows that only a small number of people chose data journalism because they were interested in data journalism or related topics. This is supported by student responses indicating a lack of interest in other elective subjects led to the selection of data journalism.

Students also believe that studying data journalism will lead to more job opportunities. A prior understanding of what data journalism is and why it is important may help students approach the subject with greater enthusiasm. A change to support this has been made in the latest revision of journalism syllabus. In which basic portions of data journalism included in courses like digital journalism and professional communication.

Majority of the students responding they feel more interested in data journalism after the course and that their decision to take up data journalism was right indicate the data journalism course was effective. Students also responded they felt more informed about the field of journalism and had improved their data journalism skills.

Initially, the course was designed to alternate between theory and practical sessions. Later, it was decided to make the practical portions the focal point because student attention was waning and some sections were difficult for the students to grasp. Not only were the students more engaged in the practical sessions, but providing theory classes in between the practical sessions also

helped them grasp those portions quickly. Making data journalism classes more practical has several advantages. Students can directly identify their errors while working with data, and the instructor can assist them in correcting them. It is observed as a newsroom-like setting, with the instructor serving as the editor (Broussard, 2015). Such a classroom which enables the student to understand and correct the errors could be important in Indian context, in which the newsrooms have only a handful of people who can handle data and mostly processing and proofreading the data could be assigned to a single individual.

### ***Changes to be made in the data journalism classroom***

As data journalism classes become more hands-on, the potential for blended learning also increases. Useful links and references were included in the course plan provided to the students. Asking the students to refer the online video tutorial ahead of the class and implementing practical exercises based on the tutorial in class can ensure timely completion of each session and can help the students with the self-paced learning (Davies, 2018; Sheridan Burns & Matthews, 2018). It will also help students to gain confidence in their ability to self-learn data journalism tools, which Bradshaw (2018) sees as a skill for solving a wide range of editorial problems. In addition to this, mentioning more tools that can be used in a variety of situations and providing instructions on how to learn them will benefit students in the future. Since the hands-on training can be conducted only to a limited number of software tools due to the time constraint, this could be a useful method to take students forward through in the learning curve.

There are several barriers to incorporate coding into a data journalism course in this context. Lack of uniform skill sets in the class, as well as a lack of time, are important factors in this. However, the course content will cover the use of coding in data journalism as well as methods for learning it in the future. Understanding data infrastructure is an important aspect of data literacy (Gray et al., 2018), so theoretical portions on data infrastructure will be added to the course plan.. The Right to Information Act and crowd sourcing as data sourcing practices were part of theory portion, but in future the plan is to include those in the practical exercises as well.

### **Conclusion**

By investigating the implementation of a data journalism course at the University of Calicut in Kerala, this study attempted to contribute to the emerging discourse on data journalism pedagogy in India. This study discussed the students' attitudes towards the data journalism elective course as

well as the challenges encountered while teaching. One of the main reasons students chose data journalism was the expectation that it would help them with job opportunities. Some students considered data journalism as a stop gap option since no other interesting elective subjects were available to them. Students consider their attitudes towards mathematics before taking data journalism, but very few mention it as a concern for taking the subject. The majority of students reported an increase in their interest in the subject, as well as statistical and data analytical skills, after completing the course. Students suggested to add more practical classes as a way to improve the data journalism course. Although theory and practical classes were initially held in alternate sessions, students preferred classes that focused on hands-on activities. In the later stages of the course, a strategy of taking the theoretical portions in between these hands-on sessions was used. The study also discussed the future changes planned for the data journalism course.

A limitation of this study is that it is only suitable for understanding the trends of the classroom discussed here. None of the findings of this study can be generalized. In India itself, the background of students in each journalism school is very different. The data skills and computer skill each student carry might be different. Therefore, a model that is successful in one classroom may not work in another. As Kashyap & Bhaskaran (2020) indicates, a reflexive and iterative approach should be adopted considering the context.

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