



Dataset for Mathematics and Science Lesson Plans Collected from Rwandan Schools

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Abstract

The data presented in this paper is related to Mathematics and Science lesson plans collected from Rwandan teachers. They were collected and analyzed to support researchers and teachers using the validated and reliable lesson plan analysis protocol (LPAP) and analyzing its data. We collected and analyzed 119 lesson plans from 26 Mathematics and Science teachers in Rwanda. These lesson plans were collected from the lockdown period (from March to May 2020) due to Covid-19, and teachers were contacted via phone calls. Teachers were solicited to provide lesson plans they had previously used. We used descriptive statistics to score the lesson plans and evaluate their effectiveness in a live class, and inferential statistics to display differences among Mathematics and Science lesson plans. The data is available for researchers to reuse and will help teachers evaluate themselves.

Keywords: Lesson plan, lesson plan analysis protocol, Mathematics, Science, lesson evaluation, data, Rwanda

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Introduction

The dataset consists of lesson plans collected from teachers in Rwanda (Habiyaremye et al., 2024) who are qualified to teach mathematics or science (physics, chemistry, and biology) and have been trained in competence-based curriculum implementation. Data acquisition involved soliciting lesson plans through phone calls to teachers, ensuring that the collected plans were completed and used. The dataset, available on the Mendeley Data repository at <http://dx.doi.org/10.17632/v3hxxjwv8xz.1>, provides valuable insights into the use of Lesson Plan Assessment Protocol (LPAP) and its analysis.

This is one of the first assessments of its kind in Rwanda, offering a step-by-step view of LPAP implementation and analysis. This data is significant for researchers, developmental partners, and education evaluators as it can be used to assess teaching practices and lesson preparation. Additionally, it allows teachers to review different lesson plans and evaluate their practices. The dataset also has potential for further analysis, including item-by-item reanalysis and examination of variables such as teacher-specific factors.

Methodology

Data description

The dataset provides an example of how to analyze the lesson plan analysis protocol (LPAP) data. The protocol is available at https://www.researchgate.net/publication/347388283_LPAP_Training_Manual_Final_version_Supplementary_materials?channel=doi&linkId=5fda6b89299bf1408816e04d&showFulltext=true. The LPAP introduction discusses the rationale of a new protocol to analyze lesson plans based on competence-based pedagogy. Appendix A shows the LPAP to be used when coding lesson plans, while Appendix B shows how to score the LPAP items and analyze their data after coding the lesson plans.

The raw data are provided in both SPSS and MS Excel files (Ndihokubwayo et al., 2021) (see LPAP Analysis.sav and LPAP Analysis.xlsx). To provide the reader with the necessary analysis procedures, we analyzed data in an MS Excel file. LPAP Analysis.xlsx contains the raw data (first sheet) and analysis (second and third sheets). The first column (column B) shows 119 lesson plan codes, while the first row (row 3) shows 27 LPAP items. The number under the items shows the number coded to each lesson plan (see "example of coded lesson plan" in the supplementary materials). LPAP is coded on the four scales: the first scale is 0, the second scale is 1, the third is 2, and the fourth is 4. Table 1 shows the qualification of teachers and school characteristics.

Table 1 Sampled teachers and school characteristics and collected lesson plans

#	Teacher's Code	Teacher's qualification	Grade taught	Location of school	Type of school	CBC training	LPs collected
Biology teachers							
1	B Ce T1	Ao	7-12	Urban	Day	Yes	5
2	B Ce T2	Ao	7-12	Rural	Boarding	Yes	9
3	B Ce T3	Ao	10-12	Urban	Boarding	Yes	9
4	B Ce T4	Ao	10-12	Urban	Boarding	Yes	5
5	B T1	Ao	7-12	Urban	Day	Yes	5
6	B T2	Ao	7-12	Rural	Day	Yes	6
7	B T3	Ao	7-12	Rural	Day	Yes	6
8	B T4	A1	7-9	Rural	Day	Yes	1
9	B T5	Ao	7-12	Rural	Boarding	Yes	1
Chemistry teachers							
1	CT1	Ao	7-9	Urban	Boarding	Yes	4
2	CT2	Ao	7-12	Rural	Boarding	Yes	5
3	CT3	Ao	7-12	Rural	Boarding	Yes	3
4	CT4	Ao	7-9	Rural	Boarding	Yes	3
Mathematics teachers							
1	M 1	Ao	10-12	Rural	Day	Yes	1
2	M 2	Ao	10-12	Rural	Boarding	Yes	3
3	M 3	Ao	10-12	Rural	Boarding	Yes	2
4	M 4	Ao	10-12	Rural	Boarding	Yes	1
5	M 5	Ao	7-12	Rural	Boarding	Yes	1
6	M 6	Ao	7-12	Rural	Boarding	Yes	1
7	M Ki 7	Ao	10-12	Rural	Day	Yes	9
Physics teachers							
1	P 6	Ao	7-12	Rural	Day	Yes	4
2	P Ki T1	A1	7-12	Rural	Day	Yes	5
3	P Ki T2	Ao	7-12	Urban	Day	Yes	9
4	P Ki T3	Ao	10-12	Rural	Boarding	Yes	14
5	P Ki T4	Ao	10-12	Urban	Boarding	Yes	6
6	P Ki T5	Ao	10-12	Rural	Boarding	Yes	2

Data collection

We used the convenience sampling technique (Fraenkel et al., 2012) to get teachers who provided us with the analyzed lesson plans. Each researcher contacted known and available teachers in his/her field by phone. During lesson plan collection, teachers were at home due to schools' closure and lockdown (after 14 March 2020). Teachers were informed about the study's rationale and solicited lesson plans they used before the Covid-19 outbreak. Thus, teachers were not asked to write new lesson plans; instead, they provided lesson plans that had already been used. We communicated with 26 qualified teachers, who provided us with 119 lesson plans to be analyzed.

The lesson plan analysis protocol (LPAP) we used to code lesson plans is valid and shows reliable data (Ndiokubwayo, Byukusenge et al., 2020a, 2020b; Ndiokubwayo, Ndayambaje et al., 2020). We followed guidelines on how to code LPAP (Ndiokubwayo, Byukusenge et al., 2020a). Two researchers who got a higher coding agreement during the reliability testing of LPAP (Ndiokubwayo, Byukusenge, et al., 2020a) shared 119 lesson plans and coded them. For instance, the first item in LPAP is to check if the "key unit competence, KUC" was written during the writing of a lesson plan and how it was written. Therefore, a coder ticks or marks in one of four scales ((1) Not written, (2) Written but not related to syllabus, (3) Written in summary and related to syllabus, or (4) Written in full and related to syllabus) under KUC item (see Appendix A in the LPAP training manual in the supplementary materials).

The "Analysis 1" and "Analysis 2" sheets in the LPAP Aanalysis.xlsx contain analyzed data, tables, and figures generated from the analysis. The means and standard deviations were computed under each item across all 119 lesson plans. The first and second LPAP scales are scored zero, the third is scored 2, while the fourth scale is scored two.

After counting the number of lesson plans under each score range, the percentage was computed to display the occurrence of each of the 27 LPAP items. For instance, if among 118 coded lesson plans on KUC for "Not written" and/or was "Written but not related to syllabus" was found in 18 (15%) lesson plans. "Written in summary and related to syllabus" was found in 9 (8%) lesson plans while "Written in full and related to syllabus" was found in 91 (77%) lesson plans.

To evaluate overall lesson plans into five evaluation categories (poor lesson plan: <50 scores, fair lesson plan: 50-69%, good lesson plan: 70-79%, very good lesson plan: 80-89%, or excellent lesson plan: 90-100%), we calculate total scores and their corresponding percentages along with all LPAP items for each teacher. We then used "countif" function to get the contribution of each range. For instance, 73% fallen into "fair lesson plan" of scores between 50% and 69% (Ndiokubwayo, Byukusenge, et al., 2020a).

Each subject's scores were detached from each lesson plan's percentage score across all LPAP items to compare subject by subject (Mathematics, Physics, Chemistry, and Biology). ANOVA single factor was computed (Ndiokubwayo, Byukusenge, et al., 2020a) among the four groups.

Ethics Statement

Before conducting this study, its research proposal was submitted to the research and innovation unit at the University of Rwanda College of Education (URCE) for approval and ethical clearance. The teachers who provided lesson plans were ensured anonymity and confidential use of their lesson plans.

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