

# Junior High School Teachers' Implementation Fidelity of Differentiated Instruction in Improving Students' Academic Performance

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**Abstract-** This study scrutinized the fidelity of DI implementation among junior high school teachers, exploring its correlation with students' appreciation and academic performance. Specifically, it examined DI implementation concerning content, process, and output, alongside students' appreciation and performance. Such analysis holds significance for educational stakeholders, offering insights into DI implementation status and pertinent information for effective execution. Results indicated a significant correlation between DI implementation by teachers and students' appreciation of it. However, no notable correlation emerged between students' academic performance and teachers' DI implementation. Further examination unveiled the teachers' lack of implementation fidelity of DI. Notably, 61% to 80% of students expressed high interest when lessons were differentiated across all aspects.

Keywords: Differentiated Instruction, implementation fidelity, academic performance, learning interest, assessment

## INTRODUCTION

Differentiated instruction is a teaching strategy which has been proven to have a significant impact on the teaching and learning process—an evidence-based practice. Evidence-based practice as cited by Diery et al. (2020), in medicine, was defined as integrating individual clinical expertise with the best available external clinical evidence from systematic research. Like the medical profession, teaching should be considered a vocational field, in which practitioners are required to act upon and apply empirical evidence (Haberfellner & Fenzl, 2017). As classrooms grow increasingly diverse, educators are confronted with a wide array of learning interests among their students. To address this diversity effectively, a prevalent approach in today's educational landscape, particularly among educational researchers and curriculum implementers, is Differentiated Instruction (DI).

Implementation fidelity, as defined by Bragstad et al. (2019) is an assessment of the degree to which group leaders deliver the intervention completely and according to protocol. According to a long line of research, lack of implementation fidelity results in less effectiveness of the designed program. This is parallel to the study of Stains et al. (2017) which concludes that "lack of implementation fidelity might result in a practice or program being less effective, less efficient, or producing less-predictable responses."

Furthermore, Moreover, the K-12 Basic Education Curriculum acknowledges the diverse needs of learners. Illustrated within the framework of the curriculum guide, the department acknowledges and underpins its framework with theories such as Experiential and Situated Learning, Reflective Learning, Constructivism, Cooperative Learning, and Discovery and Inquiry-based Learning (Department of Education, August 2016).

Despite the Department's strong endorsement of employing diverse teaching strategies, including differentiated instruction, which is learner-centered and tailored to enhance achievement in literacy, numeracy, creativity, and higher-order thinking skills, and which also accommodates students' linguistic, cultural, socio-economic, and religious backgrounds (DO No. 2, s. 2015), the 2018 results of the Programme for International Student Assessment (PISA) present a contrasting picture. Filipino students performed among the lowest of student groups in this assessment. In mathematics, less than 20% of students met the minimal standard of proficiency (Level 2), while over 50% demonstrated extremely poor proficiency (below Level 1). With scores below the PISA's lowest level of competency and

more than half of the Filipino pupils in this age group having insufficient mathematical ability, these children from the Philippines have unquestionably lagged behind their foreign counterparts in terms of education (Department of Education, 2019).

This research was prompted by the desire to investigate the extent to which junior high school teachers adhere to the implementation of differentiated instruction at Bayugan National Comprehensive High School. Additionally, the researcher seeks to understand students' perceptions and appreciation of how teachers differentiate their teaching methods.

## OBJECTIVES

The study aims to assess junior high school teachers' implementation fidelity of differentiated instruction and how students perceive it. It also investigates students' academic performance and its correlation with teachers' implementation of differentiated instruction. Ultimately, the study seeks to propose a program design for improving the implementation of differentiated instruction in educational settings.

## METHODOLOGY

The study employed a quantitative descriptive-correlational approach which involved 306 students from Bayugan National Comprehensive High School to answer a researcher-made survey questionnaire. Three professionals in the field of education validated the research tool. Logical and content validation made up the questionnaire's validation. The researcher submitted the questionnaire to a panel of specialists, including academicians from the Department of Education and a subject-matter expert from Caraga State University, for logical and content validation. The survey questionnaire was changed after the responses and recommendations from the experts after the survey data had been retrieved. The research instrument was also tried out using thirty students in the same school but of different grade levels. The reliability test resulted in 0.87 Cronbach's Alpha, which means, that, the questionnaire is highly reliable. Data analysis utilized JASP software, employing Weighted Mean to gauge DI implementation frequency and student appreciation. Additionally, it assessed students' academic performance in the first quarter of the School Year 2023-2024. The Spearman Rank Correlation Coefficient was employed to discern relationships between DI implementation, student appreciation, and academic performance.

## RESULTS

### 1. Teachers' Implementation of Differentiated Instruction as perceived by the students

#### 1.1 Teachers' Differentiation in terms of Content

Presented in Table 1 is the mean distribution of the level of teachers' implementation of DI in terms of content

**Table 1. Mean distribution of the level of teachers' implementation of differentiated instruction in terms of content**

Indicators	Mean	Description
1. The teacher conducts a diagnostic test.	3.42	sometimes
2. The teacher asks the students about their economic background.	3.27	Sometimes
3. The teacher asks the students about their prior knowledge.	3.62	Often
4. The teacher asks the students about their religious beliefs	3.12	sometimes
5. The teacher gives different tests with different levels of difficulty.	3.37	sometimes
6. The teacher cites examples using scenarios that relate to the experiences/schema of the students.	3.99	Often
7. The teacher discusses the topic using English and Mother Tongue Language.	4.17	Often
8. The teacher gives activities with various levels of difficulty.	3.57	Often
<b>Weighted Mean</b>	<b>3.37</b>	Sometimes

Range of Means: 1.00-1.49 Never; 1.50-2.49 Rarely; 2.50-3.49 Sometimes; 3.50-4.49 Often; 4.50-5.00 Always

The Table shows that teachers sometimes ask the students about their religious beliefs and often discuss the lessons using English and their Mother Tongue Language with a mean of 3.12 and 4.17, respectively. The table further conveys that the teacher differentiates the content twice a week given the weighted mean of 3.37 which has a verbal description of sometimes. It is important to streamline and optimize differentiation in terms of content and by doing so, it is by asking the students about their religious beliefs and discussing the lessons using English and Mother Tongue language to show to the students that the teacher cares and takes their differences into account.

This is parallel to the study of Onyishi and Sefo in 2020 which states that, even though DI is the most effective way of teaching an inclusive classroom, teachers in Nigeria seldom use varied instruction due to factors including time constraints, lack of diverse learning environments, a high concentration of upper-class students, inadequate teacher knowledge and skill, a lack of classroom space to

rearrange seats to create learning centers or work stations where students can complete their assignments, and rigidity in the school calendar.

## 1.2 Teachers' Differentiation in terms of Process

Table 2 presents the mean distribution of the teachers' implementation of differentiated instruction in terms of process as perceived by the students. This shows how often the teacher uses DI as a strategy when it comes to the process of teaching the lessons. Twenty-three questions were answered by the participants on how teachers differentiate the process. The table presents that teachers just sometimes allow students to create their own rules in new problem-solving situations and often encourage students to ask questions when difficulties or misunderstandings arise with the respective means of 2.80 and 4.13. With the weighted mean of 3.64, this depicts that the teacher often differentiates the instruction in terms of process, which means that, he applies DI in terms of the process thrice a week.

**Table 2. Mean distribution of the level of teachers' implementation of differentiated instruction in terms of process**

Indicators	Mean	Description
1. The teacher gives different examples with different levels of difficulty.	3.74	Often
2. The teacher cites examples using scenarios that relate to the cultural background of the students.	3.63	Often
3. The teacher cites examples using scenarios that relate to the interests of the students.	3.90	Often
4. The teacher gives different tests with different levels of difficulty.	3.67	Often
5. The teacher gives problem-solving activities in the context of the student's interest, learning style, and level of numeracy and literacy.	3.77	Often
6. The teacher allows students to create their own rules in new problem-solving situations.	2.80	Sometimes
7. The teacher anchors problem-solving skills instruction within situations meaningful to the students.	3.49	Often
8. The teacher allows the students to pursue open-ended and extended problem-solving projects.	3.45	Often
9. The teacher encourages students to experiment with alternative methods for problem-solving.	3.64	Often
10. The teacher assists the students while answering activities individually or by group.	3.89	Often
11. The teacher encourages students to use Mathematics vocabulary terms in class discussion.	3.50	Often
12. The teacher allows students to describe their thought processes orally or in writing during problem-solving	3.72	Often
13. The teacher requires students to share their thinking by conjecturing, arguing, and justifying ideas.	3.55	Often
14. The teacher allows students to write about their problem-solving strategies.	3.50	Often
15. The teacher encourages students to ask questions when difficulties or misunderstandings arise.	4.13	Often
16. The teacher encourages students to explain the reasoning behind their ideas.	3.89	Often
17. The teacher uses reading instructional strategies to help students with comprehension.	3.92	Often
18. The teacher allows students to discuss the solutions to a problem with peers.	3.72	Often
19. The teacher allows students to engage in cooperative problem-solving.	3.74	Often
20. The teacher assigns students to work in homogeneous groups.	3.45	Often
21. The teacher assigns students to work in heterogeneous groups.	3.41	Often
22. The teacher asks the students about their style of learning.	3.47	Often
23. The teacher asks the students about their interests.	3.77	Often
<b>Weighted Mean</b>	<b>3.64</b>	Often

Range of Means: 1.00-1.49 Never; 1.50-2.49 Rarely; 2.50-3.49 Sometimes; 3.50-4.49 Often; 4.50-5.00 Always

It is indeed important to inform the students that they can ask questions when they have difficulties understanding the activity. It makes them feel belong and motivated because they know someone is there to help and guide them. To corroborate the result as to why teachers only sometimes allow the students to create their own rules in problem-solving, the study of Aldossari from the Kingdom of Saudi Arabia in 2018 on the factors influencing the lack of implementation fidelity of teachers in the classroom is the time constraint, student's interests and characteristics, and individual differences. This means that the teachers' time in delivering the lesson in a particular period limits them to giving students time to create the rules for solving.

## 1.3 Teachers' Differentiation in terms of Output

Table 3 presents the mean distribution of the level of teachers' implementation of differentiated instruction in terms of output. With the means of 3.59 and 3.83, the study provides that the teacher often assigns tasks based on the student's interests and learning styles and assesses the outputs based on the different criteria the class has agreed upon concerning the kind and level of difficulty of the given task. This further suggests that, with the weighted mean of 3.73, the teacher differentiates the output thrice a week.

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**Table 3. Mean distribution of the level of teachers' implementation of differentiated instruction in terms of output**

Indicators	Mean	Description
1. When assigning practice work, the teacher ensures that the majority of the problems review previously covered material.	3.67	Often
2. The teacher assigns tasks based on the student's interests and learning styles.	3.59	Often
3. The teacher offers the students a choice of their final output or product that is based on the lesson.	3.75	Often
4. The teacher assesses the outputs based on the different criteria the class has agreed upon concerning the kind and level of difficulty of the given task.	3.83	Often
5. The teacher rewards group performance in the cooperative setting.	3.78	Often
<b>Weighted Mean</b>	<b>3.73</b>	Often

Range of Means: 1.00-1.49 Never; 1.50-2.49 Rarely; 2.50-3.49 Sometimes; 3.50-4.49 Often; 4.50-5.00 Always

With the means of 3.59 and 3.83, the study provides that the teacher often assigns tasks based on the student's interests and learning styles and assesses the outputs based on the different criteria the class has agreed upon concerning the kind and level of difficulty of the given task. This further suggests that, with the weighted mean of 3.73, the teacher differentiates the output thrice a week.

The results aligned with the department's mandate through DO No. 2, s. 2015 to differentiate the instruction based on the students' interests and learning styles. However, as the table provides, teachers still, have not fully implemented it throughout the academic year. The case is backed up by the study of Siam & Al-Natour in 2016 that to give students different options in obtaining information, teachers must be able to give students access to a variety of ways to obtain material, process ideas, build meaningful comprehension, and produce outcomes so that successful learning may occur. But, the problems faced by the teachers in doing so were, according to Ginja and Chen in 2020, a lack of facilities, a paucity of experienced teacher-educators, misunderstandings about differentiated teaching, high class sizes, restricted access to professional development training, and a lack of resources.

## **Problem 2. Students' Appreciation of the Differentiated Instruction**

### **2.1 Students' Appreciation of Differentiated Content**

Table 4 presents the mean distribution of the students' appreciation of differentiated instruction in terms of content. This shows the interest of the students when the teacher differentiates the content.

**Table 4. Mean distribution of the level of the students' appreciation of the differentiated instruction in terms of content**

Indicators	Mean	Description
1. The teacher conducts a diagnostic test.	3.54	Highly Interested
2. The teacher asks the students about their economic background.	3.41	Highly Interested
3. The teacher asks the students about their prior knowledge.	3.74	Highly Interested
4. The teacher asks the students about their religious beliefs	3.48	Highly Interested
5. The teacher gives different tests with different levels of difficulty.	3.50	Highly Interested
6. The teacher cites examples using scenarios that relate to the experiences/schema of the students.	4.07	Highly Interested
7. The teacher discusses the topic using English and Mother Tongue Language.	4.06	Highly Interested
8. The teacher gives activities with various levels of difficulty.	3.62	Highly Interested
<b>Weighted Mean</b>	<b>3.68</b>	Highly Interested

Range of Means: 1.00-1.49 Not Interested; 1.50-2.49 Slightly Interested; 2.50-3.49 Fairly Interested; 3.50-4.49 Highly Interested; 4.50-5.00 Very Highly Interested

With the means of 3.41 and 4.07, it reveals that the students are highly interested when the teacher asks the students about their economic background and cites examples using scenarios that relate to the experiences/schema of the students. This further explains that sixty-one to eighty percent of the students are interested when the teacher uses differentiated instruction in terms of content in the class. The students are interested when teachers exert effort in making the teaching and learning process meaningful to them. By implementing such, teachers can capitalize on students' high interest in a given differentiated content, creating a dynamic and engaging learning environment that foster deep understanding, curiosity, and lifelong learning.

According to McCarthy (2014) in his article entitled Learner Interest Matters: Strategies for Empowering Student Choice, when the teacher differentiates the lessons in terms of content, process, and output, it enables the interests of students and thus clearly sees the concepts.

## 2.2 Students' Appreciation of Differentiated Process

Table 5 displays the mean distribution of the students' appreciation of differentiated instruction in terms of process. As shown in the table, with the respective means of 3.23 and 4.26, it reveals that the students are highly interested when the teacher allows students to create their own rules in new problem-solving situations and assists the students while answering activities individually or by group. It makes the students motivated when teachers give them the freedom to choose the way they efficiently and effectively learn. This also breaks down the barriers to an inclusive and meaningful education.

**Table 5. Mean distribution of the level of the students' appreciation of the differentiated instruction in terms of process**

Indicators	Mean	Description
1. The teacher gives different examples with different levels of difficulty.	3.77	Highly Interested
2. The teacher cites examples using scenarios that relate to the cultural background of the students.	3.74	Highly Interested
3. The teacher cites examples using scenarios that relate to the interests of the students.	3.94	Highly Interested
4. The teacher gives different tests with different levels of difficulty.	3.58	Highly Interested
5. The teacher gives problem-solving activities in the context of the student's interest, learning style, and level of numeracy and literacy.	3.73	Highly Interested
6. The teacher allows students to create their own rules in new problem-solving situations.	3.23	Highly Interested
7. The teacher anchors problem-solving skills instruction within situations meaningful to the students.	3.68	Highly Interested
8. The teacher allows the students to pursue open-ended and extended problem-solving projects.	3.58	Highly Interested
9. The teacher encourages students to experiment with alternative methods for problem-solving.	3.75	Highly Interested
10. The teacher assists the students while answering activities individually or by group.	4.26	Highly Interested
11. The teacher encourages students to use Mathematics vocabulary terms in class discussion.	3.57	Highly Interested
12. The teacher allows students to describe their thought processes orally or in writing during problem-solving	3.87	Highly Interested
13. The teacher requires students to share their thinking by conjecturing, arguing, and justifying ideas.	3.67	Highly Interested
14. The teacher allows students to write about their problem-solving strategies.	3.70	Highly Interested
15. The teacher encourages students to ask questions when difficulties or misunderstandings arise.	4.16	Highly Interested
16. The teacher encourages students to explain the reasoning behind their ideas.	3.92	Highly Interested
17. The teacher uses reading instructional strategies to help students with comprehension.	4.03	Highly Interested
18. The teacher allows students to discuss the solutions to a problem with peers.	3.72	Highly Interested
19. The teacher allows students to engage in cooperative problem-solving.	3.70	Highly Interested
20. The teacher assigns students to work in homogeneous groups.	3.61	Highly Interested
21. The teacher assigns students to work in heterogeneous groups.	3.58	Highly Interested
22. The teacher asks the students about their style of learning.	3.79	Highly Interested
23. The teacher asks the students about their interests.	3.92	Highly Interested
<b>Weighted Mean</b>	<b>3.76</b>	Highly Interested

Range of Means: 1.00-1.49 Not Interested; 1.50-2.49 Slightly Interested; 2.50-3.49 Fairly Interested; 3.50-4.49 Highly Interested; 4.50-5.00 Very Highly Interested

In addition, with the weighted mean of 3.76, this further suggests that sixty-one to eighty percent of the students are interested when the teacher is using differentiated instruction in terms of process in the class. This means that the students want to solve problems in their own way and the teachers would assist them when needed. This is parallel to the sentiments of Bushie (2015) which is to give students choices based on their interests. Students come to school with different backgrounds. Their interests also varies so teachers would have to know what approach should be given to the learners to make the lesson meaningful to them.

## 2.3 Students' Appreciation of Differentiated Output

**Table 6. Mean distribution of the level of the students' appreciation of the differentiated instruction in terms of output**

Indicators	Mean	Description
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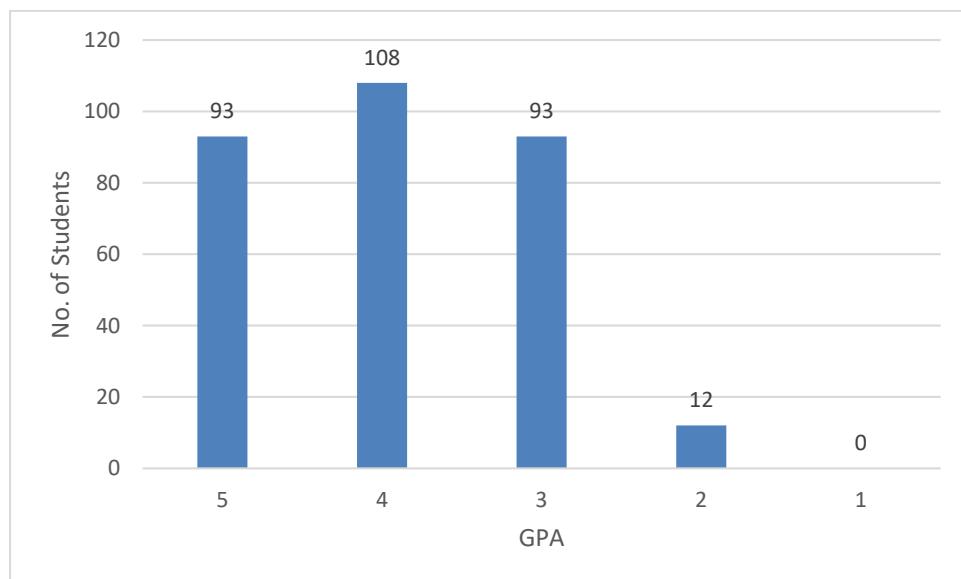
1. When assigning practice work, the teacher ensures that the majority of the problems review previously covered material.	3.87	Highly Interested
2. The teacher assigns tasks based on the student's interests and learning styles.	3.94	Highly Interested
3. The teacher offers the students a choice of their final output or product that is based on the lesson.	3.91	Highly Interested
4. The teacher assesses the outputs based on the different criteria the class has agreed upon concerning the kind and level of difficulty of the given task.	3.92	Highly Interested
5. The teacher rewards group performance in the cooperative setting.	4.01	Highly Interested
<b>Weighted Mean</b>	<b>3.93</b>	

Range of Means: 1.00-1.49 Not Interested; 1.50-2.49 Slightly Interested; 2.50-3.49 Fairly Interested; 3.50-4.49 Highly Interested; 4.50-5.00 Very Highly Interested

Table 6 displays the mean distribution of the students' appreciation of differentiated instruction in terms of output. This shows the interest of the students when the teacher differentiates the output of the lesson. As shown, with the respective means of 3.87 and 4.01, the study revealed that when the teacher assigns practice work, with the majority of the problems reviewing the previously covered material and rewards group performance in the cooperative setting respectively, the students are highly interested. Furthermore, with the weighted mean of 3.93, this means that sixty-one to eighty percent of the students are interested when the teacher is using differentiated instruction in terms of output in the class. To back these results, McCarthy (2014) stated that, promoting choice, allows the students to decide their path. This means that students are interested in choosing their own way of learning and this results accordingly, in some students choosing a product/output that may be more challenging than something they would normally pick.

### Problem 3. Level of academic performance of the students based on their Grade Point Average

The figure below features the level of academic performance of the students based on their Grade Point Average (GPA).



Legend: 5 – 90%-100%; 4 – 85%-89%; 3 – 80%-84%; 2 – 75%-79%; 1 – 74 and below

Figure 3. Students' Academic Performance in the First Quarter based on their GPA in the S.Y 2023-2024

The graph displays students' performance levels for the first quarter of the 2023-2024 school year. It reveals that 93 students achieved grades between 90-100, while 12 students fell within the 75-79 range. This corresponds to 30.39% reaching outstanding levels and 3.92% achieving fairly satisfactory results, following DepEd Order No. 8 s. 2015 guidelines. To prevent comparisons, students were alphabetically organized rather than by their grades.

### Problem 4. Significant Relationship between the Implementation of Differentiated Instruction to the Level of Academic Performance of the Students based on their Grade Point Average and Students' Appreciation of the Implementation of differentiated instruction

Table 7 presents the relationship between the implementation of Differentiated Instruction and students' appreciation of its implementation to their academic performance based on their Grade Point Average.

**Table 7.** *The significant relationship between the implementation of DI, students' appreciation of its implementation and their academic performance*

Variable 1	Variable 2	r-value	p-value	Decision	Significant
• Implementation of differentiated instruction	• Grade Point Average		.057	Fail to reject Ho	Not Significant
	• Students' appreciation of differentiated instruction	0.648	<.001	Reject Ho	Significant

Correlation is significant at 0.05 level (2-tailed)

The table indicates that the Spearman Rank Correlation Coefficient is not significant at the  $\alpha = 0.05$  level, implying no significant relationship between students' performance and teachers' implementation of differentiated instruction. However, it does reveal a significant correlation between teachers' implementation of DI and students' appreciation of differentiated instruction, with p-values of 0.032 and <0.001 ( $r=0.057$  and  $r=0.648$ ), respectively. While a long line of research proved that DI is effective, some experts and researchers in the educational landscape have expressed their skepticism on its effectiveness. Even Carol Ann Tomlinson herself, in her book called "The Differentiated Classroom" in 2014 recognized that DI is not a one-size-fits-all solution and may not always lead to improved students' outcomes if implemented.

The findings of this research indicate no correlation between whether teachers implement differentiated instruction and students' performance levels. Moreover, Delisle's (2015) article "Differentiation doesn't work" sparked substantial debate, leading to the conclusion that differentiation is effective up to a certain point. This aligns with the primary finding of this study, highlighting the inadequate fidelity in the implementation of differentiated instruction by teachers. Additionally, as noted by Finney and Smith (2016), along with Mathers et al. (2018), a lack of implementation fidelity has detrimental effects on the accuracy of assessments regarding program effectiveness. However, the result of the study also revealed that there is an association between their appreciation of its implementation and the teacher's implementation of it. This directly means that teachers implement DI tailored to the students' needs and interests.

## CONCLUSION

The primary focus of the study was to assess the fidelity with which junior high school teachers implemented Differentiated Instruction (DI) to enhance students' academic performance. However, evidence revealed a lack of fidelity in DI implementation. Despite this, students displayed high interest when lessons were differentiated across content, process, and output. Analysis of first quarter GPA indicated that only 30.39% of students achieved outstanding or satisfactory levels, with 35.29% classified as very satisfactory and a minimal 0.04% as fairly satisfactory. Surprisingly, no significant correlation was found between teachers' DI implementation and students' academic performance, but a noteworthy correlation existed between DI implementation and students' appreciation of it. These findings informed the crafting of a program design aimed at addressing identified issues.

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