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Twelfth-Grade Students' Understanding of Human Rights Violations after Learning with Discovery Education Crossword Puzzles: A Descriptive Study at SMA Muhammadiyah 9 Surabaya

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Abstract:
Crossword puzzles are widely used to engage students actively, yet little is known about how well senior high school students understand human rights violations after such media are used in Pancasila Education. Drawing on the revised Bloom's Taxonomy and the principle of retrieval practice, this study aimed to describe the level of understanding (C2) of twelfth-grade students at SMA Muhammadiyah 9 Surabaya on human rights violations after learning with Discovery Education crossword puzzles. A quantitative descriptive design was applied to all 45 students of one flagship class. Data came from a 20-item multiple-choice understanding test given once after the lesson (2 × 45 minutes) and were analyzed with frequencies, percentages, score bands, and measures of central tendency and dispersion; scores of 75 or above (the school's Minimum Mastery Criterion) were categorized as understand. The results show that 35 students (77.78%) were in the "understand" category and 10 students (22.22%) in the "less understand" category. Scores ranged from 65 to 93 (mean = 79.67, median = 79, SD = 7.17); the lower quartile coincided with the threshold, and all 10 students in the "less understand" category scored within 10 points below it. The findings imply that concept reinforcement and follow-up case discussion should be directed to students near the threshold. Because there were neither prior scores nor a comparison group, the findings describe post-learning conditions and do not indicate improvement, effects, or statistical generalization.

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Introduction (مقدمة)

Pancasila Education holds a strategic position in shaping students as citizens who understand their rights and obligations and respect the values of democracy, justice, and human rights. Its teaching is directed not only at mastery of civic knowledge, but also at the development of civic disposition and civic skills (Isnariah et al., 2025). The United Nations (2011) describes human rights education as education about, through, and for human rights; the "about" dimension concerns knowledge and understanding of human rights norms and principles, and it is the dimension examined in this study.

One important topic in Grade XII is human rights violations, which covers the definition of human rights, forms of violations, causal factors, and efforts toward prevention and enforcement (Badan Standar, Kurikulum, dan Asesmen Pendidikan [BSKAP], 2024). The topic is rich in interrelated terms and concepts, such as discrimination, persecution, bullying, and legal protection, so students need to distinguish and explain them in real situations rather than merely memorize them.

One alternative for actively engaging students is crossword puzzle media, which presents clues to be answered in horizontal and vertical boxes. The systematic review by Arnold et al. (2024) of 29 studies in health professions education reported the positive potential of crossword puzzles for engagement and knowledge acquisition. Because completing a crossword puzzle requires students to retrieve information from memory, its use can be associated with *retrieval practice*, which, according to the systematic review by Agarwal et al. (2021), benefits learning in schools. In citizenship subjects, crossword puzzles have been examined through a quasi-experiment (Cahyono, 2019), a pre-experiment (Salsabila et al., 2025), and classroom action research (Yudhistira et al., 2025).

These studies mainly focus on learning outcomes, that is, differences between pretest and posttest scores or between experimental and control groups. A picture of senior high school students' level of understanding of human rights violations after learning with this medium still appears to be limited. This gap matters theoretically because three bodies of theory converge on the problem. First, the revised Bloom's Taxonomy distinguishes understanding (C2) from remembering (C1) and treats conceptual knowledge as something to be interpreted, classified, and explained rather than recited (Anderson & Krathwohl, 2001; Krathwohl, 2002). Second, research on retrieval practice shows that recalling information strengthens later retention more than restudying it (Roediger & Karpicke, 2006; Rowland, 2014), which is the mechanism most plausibly engaged by a crossword puzzle; yet recalling a term does not guarantee that students can explain it or apply it to a case. Third, models of human rights education distinguish the transmission of knowledge and values from transformation and action (Tibbitts, 2002; Bajaj, 2011), so the level of conceptual understanding is a baseline that needs to be known before deeper learning goals can be pursued. Whether a crossword-based lesson leaves students at the level of understanding expected in Pancasila Education has therefore received little descriptive attention. A descriptive approach was chosen because this study aims to describe the post-learning condition without testing the effect of the medium (Sugiyono, 2019; Cohen et al., 2018).

The study is expected to contribute in two ways. Practically, the results give teachers a picture of students' level of understanding and a basis for reinforcing students in the "less understand" category. Academically, the results provide a descriptive baseline on civic knowledge of human rights violations at Grade XII level, which can be used to design quasi-experimental research or classroom action research.

Based on the above, the research question of this study is: how is the level of understanding of Grade XII students at SMA Muhammadiyah 9 Surabaya on human rights violations after learning with Discovery Education crossword puzzle media? To answer it, the objectives of the study are (1) to describe the distribution of students' level of understanding in the "understand" and "less understand" categories, based on the Minimum Mastery Criterion (KKM) of 75; (2) to describe the central tendency and dispersion of students' scores; and (3) to analyze how scores are distributed around the KKM threshold in order to identify the students who need reinforcement.

Literature Review (مراجعة الأدبيات)

2.1 Understanding in the Revised Bloom's Taxonomy

Anderson and Krathwohl (2001) revised Bloom's Taxonomy into six cognitive processes: remember, understand, apply, analyze, evaluate, and create. The revision is two-dimensional: the cognitive process dimension is crossed with a knowledge dimension consisting of factual, conceptual, procedural, and metacognitive knowledge (Krathwohl, 2002). This study focuses on the process of understanding (C2), which includes interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining. In the topic of human rights violations, terms such as discrimination, persecution, and bullying are conceptual knowledge, so understanding them means relating concepts to one another and to cases, not recalling isolated facts. Understanding is reflected in the ability to explain the definition of human rights, classify forms of violations, give examples of violations in real situations, infer causal factors, and explain efforts toward prevention and enforcement. Test items that only ask for definitions measure remembering (C1) more than understanding.

2.2 Human Rights Education and Civic Knowledge

Human rights education is commonly described as education about, through, and for human rights (United Nations, 2011). Education about human rights provides knowledge and understanding of human rights norms and principles and is the dimension examined here. Tibbitts (2002) distinguished three models of human rights education (values and awareness, accountability, and transformation), the first of which emphasizes knowledge of human rights and endorsement of their values; Bajaj (2011) similarly described approaches oriented to global citizenship, coexistence, and transformative action. From the standpoint of citizenship education, Westheimer and Kahne (2004) showed that conceptions of the good citizen range from the personally responsible citizen to the participatory and justice-oriented citizen. Knowledge of rights and their violations is a necessary base for the more demanding conceptions but not sufficient for them. This study therefore measures only the knowledge-and-understanding base and makes no claim about attitudes, behavior, or participation.

2.3 Crossword Puzzles as an Active Learning Medium

Crossword puzzles ask students to interpret clues, retrieve concepts from memory, and check the fit of answers through intersecting boxes. This activity is in line with retrieval practice, which has been shown in laboratory and classroom settings to produce better long-term retention than restudying (Roediger & Karpicke, 2006; Karpicke & Blunt, 2011; Rowland, 2014; Agarwal et al., 2021) and is rated among the more useful learning techniques (Dunlosky et al., 2013). It is also in line with the principle of students' active involvement in the learning process, for which reviews report support (Prince, 2004; Freeman et al., 2014), although the evidence of Freeman et al. comes from undergraduate science, engineering, and mathematics courses and cannot be transferred automatically to Grade XII civic education. However, crossword puzzles are not automatically equivalent to a complete discovery learning model; that model demands exploration, discussion, verification, and drawing conclusions, and Mayer (2004) cautions that

unguided discovery is less effective than guided methods of instruction. In this study, the crossword puzzle is positioned as a medium for reinforcing concepts.

It should also be distinguished that Discovery Education in this study is the name of the platform used to compile the crossword puzzles, not the theory of *discovery learning*. The crossword puzzles were compiled through Puzzlemaker by Discovery Education (https://puzzlemaker.discoveryeducation.com), whose Criss-Cross feature asks users to enter a title and a list of words and clues to be arranged into horizontal and vertical boxes (accessed 19 January 2026).

2.4 Grade XII Material on Human Rights Violations

The material on human rights violations in Grade XII covers the definition of human rights and human rights violations, forms of violations, causal factors, and efforts toward prevention and enforcement of human rights (BSKAP, 2024). In the lesson studied, the material was delivered according to the teaching module and learning objectives used by the school, namely so that students can understand the forms of human rights violations.

2.5 Previous Studies and Position of This Study

Table 1 summarizes the previous studies closest to this study. In addition, Torres et al. (2022) examined the relationship between crossword puzzles and knowledge retention, and Arnold et al. (2024) synthesized the use of crossword puzzles in health professions education.

Table 1. Summary of Previous Studies and Position of This Study

Researcher	Design and subjects	Findings	Difference from this study
Cahyono (2019)	Quasi-experiment with a control group; Grade XI students of SMA Negeri 3 Subang; TPS model with a *crossword puzzle* strategy	Significant *posttest* difference (p = 0.003); positive effect on *civic knowledge*	Tests effect with a control group; this study has no comparison group and only describes the post-learning condition
Yudhistira et al. (2025)	Classroom action research; Grade VII E students of SMP Negeri 51 Palembang; crossword puzzle media in the PPKn subject	Learning outcomes improved after the use of crossword puzzles	Action- and improvement-oriented at the junior high school level; this study describes the post-learning condition of Grade XII senior high school students
Salsabila et al. (2025)	One-group pretest-posttest pre-experiment; 37 Grade VII students; quantum teaching with crossword puzzle media in citizenship education	Post-treatment scores increased significantly; all students achieved mastery	Tests effectiveness with initial scores; this study has no initial scores and only describes the post-learning condition
This study	Quantitative descriptive; test results of 45 Grade XII students of SMA Muhammadiyah 9 Surabaya	35 students (77.78%) understand, 10 students (22.22%) less understand	No initial scores or control group; does not test effect

Source: Processed by the author from the cited articles.

These three studies support the relevance of crossword puzzles for active learning and learning outcomes. This study complements them with a picture of Grade XII senior high school students' level of understanding of human rights violations after learning with this medium, without claiming effect or improvement.

2.6 Conceptual Framework

Taken together, the theories above suggest the following reasoning, which guides the interpretation of the results but is not tested by them. (1) A crossword puzzle requires students to retrieve and interpret terms, which engages retrieval practice and active involvement. (2)

Retrieval and interpretation of human rights terms can support conceptual understanding (C2) of the forms, causes, and enforcement of violations. (3) Understanding is observed as a test score and is categorized against the KKM. Because the design is descriptive, the framework is used to interpret the distribution of scores, not to explain it causally. Moreover, retrieving a term from a clue is a lower cognitive demand than explaining or inferring, so a crossword-based lesson is expected to support, but not by itself to guarantee, understanding at the C2 level; this point is taken up in the discussion.

Method (منهج)

3.1 Approach and Design

This study used a quantitative approach with a descriptive (survey-type) design, which is appropriate when the aim is to describe the status of a variable in a defined group at one point in time without manipulating conditions (Creswell, 2012; Cohen et al., 2018; Sugiyono, 2019). The variable was the level of understanding (C2) of human rights violations, operationalized as the score on a post-learning test and categorized against the KKM. It was measured once after the learning that used Discovery Education crossword puzzle media, without initial scores and without a comparison group, so this study does not test the effect of the medium and is not intended for statistical generalization.

3.2 Place and Time

The study was conducted at SMA Muhammadiyah 9 Surabaya in January 2026.

3.3 Research Subjects

The population was the Grade XII students of SMA Muhammadiyah 9 Surabaya. The subjects were 45 Grade XII ITI students, the international flagship class, who took part in learning on human rights violations with Discovery Education crossword puzzle media and completed the understanding test; all students took the test. The Grade XII level was chosen purposively, a non-probability technique in which participants are selected for a defined purpose (Etikan et al., 2016), because, according to the author's observation, students at this level have greater maturity and more critical thinking, and because the topic is taught at this level (BSKAP, 2024). The school was also accessible to the author as a supporting teacher. Because the study covered all 45 students of this class (a census of the class), no sampling error is involved, and the results describe this class only.

3.4 Data Collection Procedure

The procedure had three steps. First, learning on human rights violations used crossword puzzle media compiled through the Discovery Education platform (see section 2.3) with a time allocation of 2 lesson periods (2 × 45 minutes), following the teaching module and learning objectives used by the school. Second, after the learning, all students completed the understanding test. Third, the scores were collected, coded (S-01 to S-45; Appendix 1), and tabulated for analysis.

3.5 Research Instrument

Data were collected with an understanding test given to all subjects after the learning. The test was in multiple-choice form with 20 items, prepared by the author to measure the process of understanding (C2) on human rights violations (Anderson & Krathwohl, 2001). The multiple-choice format is widely used in classroom assessment and can measure understanding when items require interpreting, classifying, or inferring rather than recalling definitions (Haladyna et al., 2002). The test was validated by the school principal before use. Validity evidence is therefore

limited to the judgment of one reviewer: this study does not report an expert-panel content validity index (Lawshe, 1975), empirical trials, item analysis, or an internal-consistency reliability coefficient (Tavakol & Dennick, 2011). This is listed as a limitation (section 4.5).

3.6 Data Analysis Technique

Data were analyzed descriptively (Sugiyono, 2019) in four steps. First, scores were calculated with the formula (obtained score ÷ maximum score) × 100. Second, students were categorized as understand if the score was ≥ 75, which is the Minimum Mastery Criterion (Kriteria Ketuntasan Minimal, KKM) of the Pancasila Education subject at SMA Muhammadiyah 9 Surabaya, and less understand if below it. Third, percentages were calculated with P = (f ÷ N) × 100%, where f is the number of students in a given category and N is the total number of students. Fourth, the mean, median, standard deviation (sample standard deviation), range, and quartiles (inclusive method) were calculated, and scores were grouped into five-point score bands to examine how scores were distributed around the KKM. No inferential tests were conducted because the test data came only from the post-learning condition.

3.7 Research Ethics

The study was conducted by the author, who is a supporting teacher of the Pancasila Education subject at SMA Muhammadiyah 9 Surabaya, so it was carried out at the author's place of teaching and did not require a separate permission letter. Test results are reported in aggregate and with student codes (Appendix 1), so students' identities are not disclosed.

Results (النتائج)

4.1 Students' Understanding Test Results

The understanding test was given to 45 students after the learning. Based on the category threshold of score ≥ 75 (KKM), the distribution in Table 2 was obtained.

Table 2. Distribution of Grade XII Students' Level of Understanding of Human Rights Violations

Category	Number of students (f)	Percentage (%)
Understand	35	77.78
Less understand	10	22.22
Total	45	100.00

Source: Research data, processed (N = 45).

Table 2 shows that 35 of 45 students (77.78%) were in the understand category and 10 students (22.22%) in the less understand category. Because there were 45 subjects, each student is equivalent to about 2.22 percentage points, so percentages should be read together with the number of students. These results describe the post-learning condition; because no initial scores or comparison group were available, they do not show an improvement in understanding. Student scores ranged from 65 to 93, with a mean of 79.67 and a standard deviation of 7.17 (Appendix 1).

4.2 Analysis of Score Distribution

The two-category classification in Table 2 hides how scores were distributed around the criterion, so scores were also grouped into five-point bands (Table 3).

Table 3. Distribution of Students' Scores by Score Band

Score band	Number of students (f)	Percentage (%)
65–69	4	8.89
70–74	6	13.33

75–79	13	28.89
80–84	9	20.00
85–89	8	17.78
90–100	5	11.11
Total	45	100.00

Source: Appendix 1, processed (N = 45). Scores of 75 or above are in the understand category.

Four patterns can be read from Table 3 and Appendix 1. First, the distribution is concentrated and close to symmetrical: the mean (79.67) and median (79) almost coincide, the middle half of the scores runs from 75 to 85, and the standard deviation of 7.17 is about 9% of the mean, so most students performed at a similar level rather than splitting into clearly high and low groups. Second, the criterion lies at the lower quartile of the distribution: 13 students (28.89%) scored 75–79, including four students who scored exactly 75, and 23 of 45 students (51.11%) scored below 80. A substantial part of the "understand" category is therefore close to the margin of the criterion, and the category label should not be read as secure mastery. Third, the "less understand" group is near the criterion, not far below it: its mean was 70.10, which is 4.90 points under the KKM, six of the ten students scored 70–74, and the lowest score was 65. Fourth, high attainment was present but limited: 13 students (28.89%) scored 85 or above and 5 students (11.11%) scored 90 or above.

Discussion (مناقشة)

The finding that about four in five students reached the KKM is consistent with the expectation that a lesson built on retrieving and interpreting terms supports conceptual understanding (Roediger & Karpicke, 2006; Agarwal et al., 2021), but this study cannot establish that link because the learning process was not observed and no baseline exists. Two theoretical points call for a careful reading. First, a crossword puzzle primarily elicits recall of a term from a clue, which in the terms of Anderson and Krathwohl (2001) is closer to remembering (C1); understanding (C2) requires students to explain, classify, and infer, for example to decide whether a case is a violation and which right is affected. Reviews of the testing effect also indicate that its benefit varies with the conditions of retrieval and is larger when feedback is given (Rowland, 2014), which was not examined here. Second, the test was intended to measure C2, so the proportion meeting the KKM is compatible with students going beyond term recall; however, without item-level data this cannot be verified.

The most informative result is not the proportion of 77.78% but where students stand relative to the criterion. Because scores clustered between 75 and 85 and the KKM lies at the lower quartile, the classification is sensitive to the cut score: with a threshold of 70, 41 students (91.11%) would be in the understand category, whereas with a threshold of 80 only 22 students (48.89%) would. The ten students in the less understand category lie on average 4.90 points under the KKM, which suggests that targeted reinforcement of specific concepts may be more appropriate for them than re-teaching the whole topic; which concepts need reinforcement cannot be determined without item-level analysis. Students who scored 75–79 deserve similar attention because a small decline in performance would place them in the less understand category.

The subjects came from a flagship class, so this pattern cannot be assumed to be the same in regular classes. The proportion also needs to be read together with the classical mastery criterion set by the school, which is not available in the data of this study. The previous studies in Table 1 differ in design, subjects, and instruments, and they ask whether scores changed after the use of crossword puzzles, whereas this study asks where students stand after the lesson; their results therefore cannot be compared directly. The two kinds of evidence are complementary: if

a future pretest or comparison group is added, the clustering near the KKM observed here is the specific pattern to be explained.

The results of this study cannot be read as an effect of the medium. Students' prior knowledge, the teacher's explanations, previous learning experiences, and the form of the test could also potentially influence the results, and these factors were not controlled.

4.4 Implications of the Findings

Academic implications. First, the study provides a descriptive baseline of Grade XII students' understanding of human rights violations that can inform the design of quasi-experimental research or classroom action research; the clustering of scores near the KKM and the sensitivity of the pass proportion to the cut score show that future studies should report score distributions and not only pass rates. Second, the study illustrates how the revised Bloom's Taxonomy can be used to describe civic knowledge at the understanding level and indicates the need for item-level evidence to separate remembering (C1) from understanding (C2) in human rights tests. Third, in terms of the models of human rights education (United Nations, 2011; Tibbitts, 2002; Bajaj, 2011), the study characterizes only the "about" dimension; the "through" and "for" dimensions, together with students' attitudes and behavior, remain for further research and are not findings of this study.

Practical implications. For teachers, the crossword puzzle medium can be retained as a concept-reinforcement activity and followed by case discussion, for example a bullying case in which students identify the rights violated, the impact on the victim, and the actions that should be taken, so that retrieved terms are used to explain real situations, which is the C2 process. Follow-up feedback is most efficiently directed first to students who scored 65–74 and then to those who scored 75–79, who are close to the criterion. For the school, reporting the distribution of scores together with the KKM gives a more accurate picture than the pass proportion alone, and Pancasila Education assessment should add attitude and behavior as separate dimensions.

4.5 Research Limitations

This study has several limitations. First, as a descriptive study in one school, its findings are not intended for statistical generalization. Second, without initial scores and a comparison group, this study cannot conclude improvement or an effect of the medium. Third, understanding was categorized on a single threshold; although score bands were examined, no item-level or indicator-level analysis was possible, so the aspects of understanding that were weaker could not be identified. Fourth, the data came only from the understanding test, so the learning process and the responses of teachers and students were not examined. Fifth, the instrument was prepared by the author and validated only by the school principal, without an expert-panel content validity index, empirical trials, or reliability tests. Sixth, the author is also a teacher at the school where the study was conducted, so the potential for subjectivity bias needs to be considered when reading the results. Seventh, the subjects came from one flagship class that does not necessarily represent regular-class students. Eighth, students' attitudes and behavior were not measured.

5. Conclusion (الخاتمة)

5.1 Conclusion

After learning with Discovery Education crossword puzzle media, the understanding of human rights violations among the 45 Grade XII students of SMA Muhammadiyah 9 Surabaya was generally adequate but concentrated near the criterion: 35 students (77.78%) met the KKM of 75, and the 10 students who did not scored on average only 4.90 points below it. Three conclusions follow. First, the post-learning condition is satisfactory against the criterion but has a narrow margin, since about half of the students scored below 80. Second, the shape of the distribution,

not the pass proportion alone, is the more useful basis for planning follow-up, because the classification is sensitive to the cut score. Third, these findings describe one flagship class after one lesson and do not show improvement or an effect of the medium, because no initial scores or comparison group were available.

5.2 Recommendations

For teachers, crossword puzzles can be used as a concept-reinforcement activity followed by case discussion, with feedback directed first to students who scored below the KKM and then to those near it. For schools, Pancasila Education assessment needs to cover understanding, attitudes, and behavior as different dimensions, and score distributions should be reported together with the KKM. For future researchers, it is recommended to use a quasi-experimental design with a control group or classroom action research; to use instruments tested for content validity (Lawshe, 1975) and reliability (Tavakol & Dennick, 2011) and analyzed at the item level by understanding indicators; to involve more than one class, including regular classes; and to add attitude measurement or behavioral observation.

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