education sciences

MDPI

Article

Authentic Assessment Implementation in Natural and Social Science

Eddy Sutadji [1,*], Herawati Susilo [2], Aji Prasetya Wibawa [1], Nidal A. M. Jabari [3] and Syaiful Nur Rohmad [1]

[1] Faculty of Engineering, Universitas Negeri Malang, Malang 65145, Indonesia; aji.prasetya.ft@um.ac.id (A.P.W.); syaifulnurrohmad@gmail.com (S.N.R.)
[2] Department of Biology, Faculty of Mathematics and Natural Science, Universitas Negeri Malang, Malang 65145, Indonesia; herawati.susilo.fmipa@um.ac.id
[3] Department of Applied Computing, Palestine Technical University Kadoorie, Arroub Camp St., Hebron P.O. Box 7, Palestine; nidal.jabari@ptuk.edu.ps
* Correspondence: eddy.sutadji.ft@um.ac.id

Abstract: Assessment methods are important to create qualified graduates who are ready to face the real world. Authentic assessment is considered to be the most effective method to achieve this. The application of authentic assessment is often universal. However, there is a difference between natural sciences and social sciences. If it is used for different scientific constructions, then the authentic assessment should also be different. Therefore, there is a need for authentic implementation research in these two fields of science. This research is survey research with quantitative descriptive method. This study focuses on the analysis of differences in implementation of the assessment carried out, assignment techniques, assessment components, and post-assessment at the State University of Malang in two different fields of science, namely natural sciences and social sciences. The population in this study was 1069 lecturers represented by 270 sample lecturers. There are 106 (39.26%) samples of lecturers representing 388 (36.3%) lecturer populations from 2 natural fields and 164 (60.74%) samples representing 681 (63.7%) lecturer populations from 6 social fields. The analysis is carried out by comparing the results of each aspect of the assessment implementation in the two fields. Almost all aspects of authentic assessment between the natural and social sciences had no difference. The only differences were in the assessment form and individual assignment techniques that were performed. Social science conducted non-test assessment only higher than the natural science. Measured tests were primarily used in the natural science using Higher-Order Thinking Skills questions. Performance test was mostly conducted in social science.

Keywords: authentic assessment; education evaluation; natural science; social science

Citation: Sutadji, E.; Susilo, H.; Wibawa, A.P.; Jabari, N.A.M.; Rohmad, S.N. Authentic Assessment Implementation in Natural and Social Science. *Educ. Sci.* **2021**, *11*, 534. https://doi.org/10.3390/educsci11090534

Academic Editors: Sandra Raquel Gonçalves Fernandes, Marta Abelha and Ana Teresa Ferreira-Oliveira

Received: 14 July 2021
Accepted: 7 September 2021
Published: 13 September 2021

1. Introduction

The world is developing very rapidly. This causes the education world to evolve very quickly too. Students are not only required to understand and memorize but also able to analyze critically and practice well in the real world. In addition to the teaching and learning condition factors, the assessment method factor is essential to create qualified graduates who are ready to face the real world [1,2]. Authentic assessment is considered to be the most effective assessment method to achieve this.

The selection of authentic assessment over traditional assessment is based on the advantages of it. Moreover, there are several differences between authentic and traditional assessment. The traditional assessment is product oriented, while the authentic assessment is process oriented. It means that traditional assessment used to evaluate the subject knowledge by comparing it against standards or other learners. While authentic assessment aims to evaluate the subject proficiency by asking them to perform real-life tasks. Based on this purpose, an authentic assessment has an advantage in which it provides a true picture of

the students' learning conditions, gives more information about students' strengths, weaknesses, needs, and preferences that can assist in adjusting instruction toward improving learning activities.

Moreover, authentic assessment is regarded as a better and real approach in the assessment. This approach associates learning in real and quite complex situations and contexts [3–5]. The assessment is based on student practice in the real world [6,7] that cannot be done by traditional testing. Traditional testing cannot explore real changes in student knowledge. On the other hand, an assessment approach that emphasizes the learning process and encourages students to carry out cognitive and reflective activities follows the constructivist concepts. In contrast, authentic assessment reflects these alternative assessment techniques. This assessment is based on authentic learning assignments and not a separate test and focuses as much on the process, as is the product [4]. Authentic assessment requires skills implementation that is needed in the classroom and the utilization to support further learning [8,9]. In this assessment, students demonstrate their skills toward an attitude in a real-life context and are assessed based on this fundamental performance [10].

The authentic assessment shows the application of specific student skills and assessments and focuses more on problem-solving, understanding, critical thinking, reasoning, and metacognition. Therefore, students are expected to handle meaningful material and problem solving through authentic assessment [11]. In other words, authentic assessment requires students to use prior knowledge, current teaching, and skills to solve real and complex problems. For example, students can create projects on their chosen topic, prepare research reports, and present their final products to evaluators [9]. On the other hand, research of [12] provided evidence that collaborative concepts in the peer assessment process, self-assessment, and assessment conducted by lecturers provide valid and authentic data on student performance.

The application of authentic assessment is often formulated into universal terms even though there is a difference between natural science and social science. The social and natural sciences tend to approach the question of truth and objective reality in different manners. Social science emphasizes that all human representations of reality are contingent constructs; some will even argue against it and feel it is meaningless to talk about the objective reality [13]. Meanwhile, natural sciences often visualize and conclude an accurate and realistic representation. The difference between constructivism and realism tends to lead to different positions [14,15]. The main interest in these two disciplines is very different. Natural or natural science predicts and manifests all-natural phenomena, whereas social science predicts and explains human behavior and psychology [16]. If scientific construction is different, the authentic assessment should also be different. Therefore, research is needed on the implementation of authentic assessment in these two fields of science, so that the future authentic assessment is no longer considered something universal but having different implementations between natural science and social science. This study aims to explore the facts of authentic assessment implementation in two fields of science: social and natural sciences, to clearly described the authentic assessment.

The subjects of this study were lecturers in eight faculties at the State University of Malang. The classification of social science and natural science is seen through the criteria for new student admissions in Indonesia, several faculties are included in the classification of social sciences and humanities such as the Faculty of Education, Faculty of Letters, Faculty of Economics, Faculty of Social Sciences, Faculty of Sports Science, and Faculty of Psychology Education. Meanwhile, those classified into natural sciences are the Faculty of Engineering and the Faculty of Mathematics and Natural Sciences.

The novelty of this research is that there is a comparison between the implementation of authentic assessments in two major fields of science, namely natural and social science for all Higher Education Institutions that use a life-based learning approach (LBL) which aims to develop student capacity holistically. Previous research has discussed more about

approaches and differences in scientific context, has not discussed the implementation of authentic assessments carried out in these two fields.

2. Research Methods

This research was survey research with quantitative descriptive method. This study focused on the elaboration of lecturers on the performed assessment, assignment techniques, assessment components, and post-assessment of authentic assessment at the State University of Malang as an educational provider institution for prospective educators in two different fields of science, natural science and social science.

The population and samples are adjusted to the scope and objectives of the research. The population is the entire research subject [17,18]. The population in this study were all lecturers of the State University of Malang. The samples were taken randomly and were representatives of each faculty in the State University of Malang. The number of samples was calculated using the Slovin formula [18] with the error tolerance limit of 5%.

$$n = N/(1 + N.(e)2) \quad (1)$$

Note:

n = Total Samples
N = Total Population
e = Error Tolerance Limit

To consider the number of samples at each faculty, as seen in Table 1, the calculation was carried out proportionally using the proportional allocation formula [19,20].

$$ni = (Ni/N)n \quad (2)$$

Note:

ni = Total samples from each faculty
Ni = Total population in the faculty
N = Overall total population
n = Overall total samples

Table 1. Number of samples for each faculty.

Science	Faculty	Population	Proportional Sample
Natural Science	Faculty of Mathematics and Science	201	55
	Faculty of Engineering	187	51
Social Science	Faculty of Letter	197	53
	Faculty of Economics	145	39
	Faculty of Education	149	40
	Faculty of Sport Science	57	15
	Faculty of Social Science	105	9
	Faculty of Psychology Education	28	8
	TOTAL	1069	270

A Processed from 2020 UM Statistics.

Data collection using primary data was collected through a questionnaire in the form close-ended question. The results of the study were analyzed using quantitative descriptive based on the highest number of scores for each of the provided options and chi-square analysis [21–23]. The scientific division in question was adjusted to the new student registration rules which divide the faculties at the State University of Malang into the natural and social sciences.

The pre-research activities carried out were establishing research problems, determining the scope and limitations of the research, compiling research designs or designs, developing research grids and instruments, validating research instruments, conducting instrument trials, refining instruments based on test results.

In the research process, research data were collected through Google Form by distributing the link to various WAg lecturers in each faculty and institution by asking for help from the Unit Leaders (faculty and institutions), openly to all lecturers and students at the State University of Malang. The data were then analyzed descriptively using percentages. Post-research activities are writing research results in the form of research articles for publication.

The variables in this study consisted of: the assessment form, the assignment technique, the assessment component, and the post-assessment which are summarized in 12 validated questions as seen in Table 2. The results of the validation show that all questions were valid and could be used in data collection activities.

Table 2. Item questions and instrument validation.

Indicator	Code	Questions	Validation Result
Assessment Form	Q1	The assessment form that is often carried out by lecturers	1.00
	Q2	If the "test" type of assessment is selected, what you will often use is (can choose more than one answer).	0.90
	Q3	For the written "test", the items difficulty level given to students is	0.90
	Q4	For the "non-test" assessment, an assessment form that is often done is	1.00
Assignment Technique	Q5	The most frequently performed individual assignment is	0.90
	Q6	The most frequently performed group assignment is	1.00
	Q7	Assessment implementation that is relevant to current topics in the student learning environment	0.90
	Q8	Assessment implementation that is currently being carried out helps students gain, change or develop skills, attitudes, ideals (ideals), appreciations (awards) and knowledge (knowledge)	0.80
Assessment Component	Q9	The assessment component that is carried out by the lecturer	0.90
Post-assessment	Q10	As a lecturer, do you provide feedback (discussion) for the assessment results that have been done	0.80
	Q11	If lecturers follow-up the assessment results, the form of follow-up is	0.90

In looking at the differences in authentic assessments carried out in the social sciences and natural sciences, several indicators are needed, namely: the form of assessment, assessment techniques, assessment components, and post-assessment so that a complete picture is obtained where the basic differences between authentic assessments in the social field are located with the natural sciences.

3. Result and Discussion

Authentic assessment can be underlined as a type of assessment which, when integrated into the learning framework, becomes an exciting instruction [11]. As a type of assessment, it is vital to know the assessment form and the assignment technique.

3.1. Assessment Form

The form of assessment that is most often carried out by lecturers in the natural field of science is 92.04% stating that the assessment most often carried out is a combination of test and non-test assessments. Meanwhile 8.64% only carry out the test. Meanwhile, in the field of social science, 84.57% stated that the most frequent assessments were a combination of test and non-test assessments. Meanwhile 8.64% only carried out the test and 6.79% only carried out the Nontest assessment (Figure 1). So, the form of assessment carried out by the majority of lecturers at this time is a mixture of tests and non-tests. But the visible difference between the form of assessment in the social sciences and the natural field lies in the use of the non-test form only just found in the social sciences.

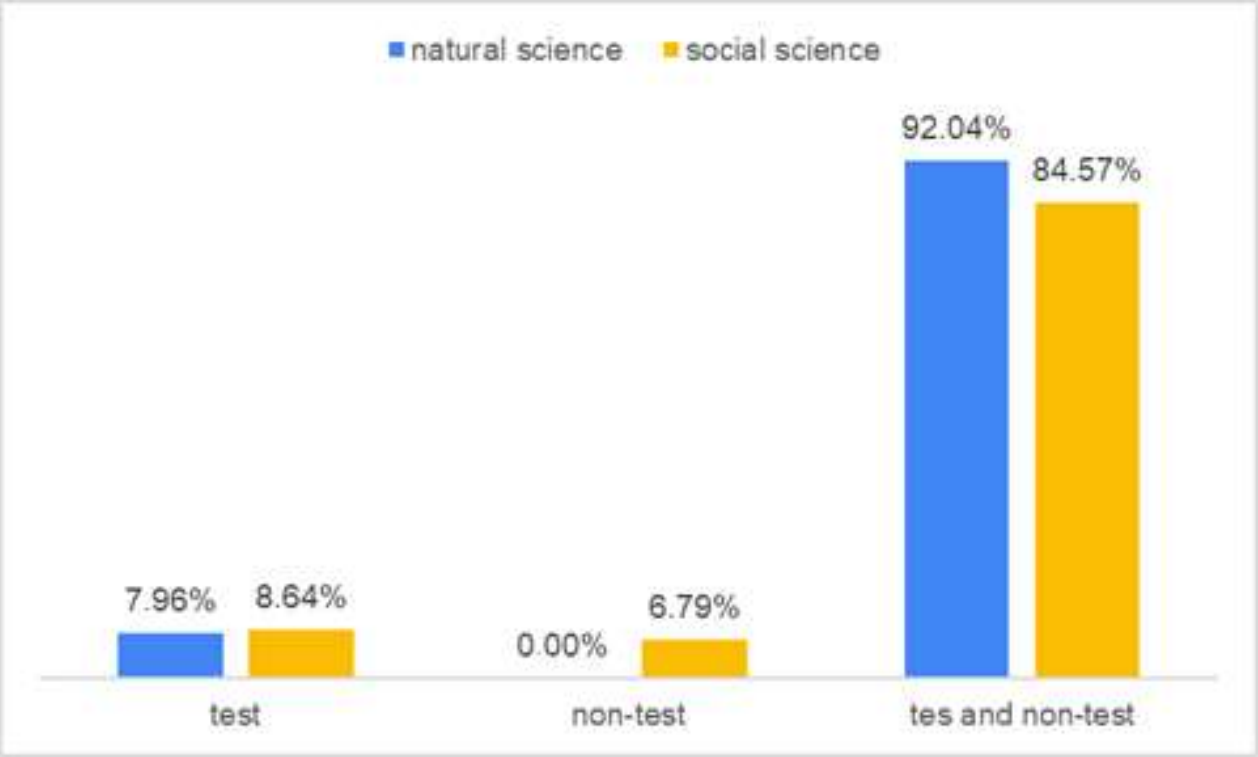

Figure 1. The form of assessment carried out by Lecturers in the field of natural sciences and social science.

Meanwhile, test form in the field of natural sciences, most often carried out according to natural science lecturers are written tests of 45.95%, performance tests (performance) 37.39%, oral tests (interviews) 16.67%. Meanwhile, for social science lecturers, according to the lecturers, the form of tests that are most often carried out are written tests by 21.22%, performance tests (performance) 54.69%, oral tests (interviews) 24.08% (Figure 2). The real difference seen in these two fields of science is that the use of written tests is mostly carried out by lecturers in the natural field, in contrast to lecturers in the social field who do more performance tests. This indicates a good implementation. Performance appraisal, portfolio assessment, and project appraisal are good authentic assessments to carry out. So, the implementation of the performance assessment has been carried out and needs to be supplemented with various other tests such as portfolio assessment and project assessment [24]. The data above were corroborated by the previous research of [25] that stated that to improve the effectiveness of mathematics learning, collaborative problem-

based learning model with authentic assessment model could be considered as one of the learning models in the classroom. The benefit of authentic assessment is that students learn to develop and use self-regulated skills to achieve high learning goals [26].

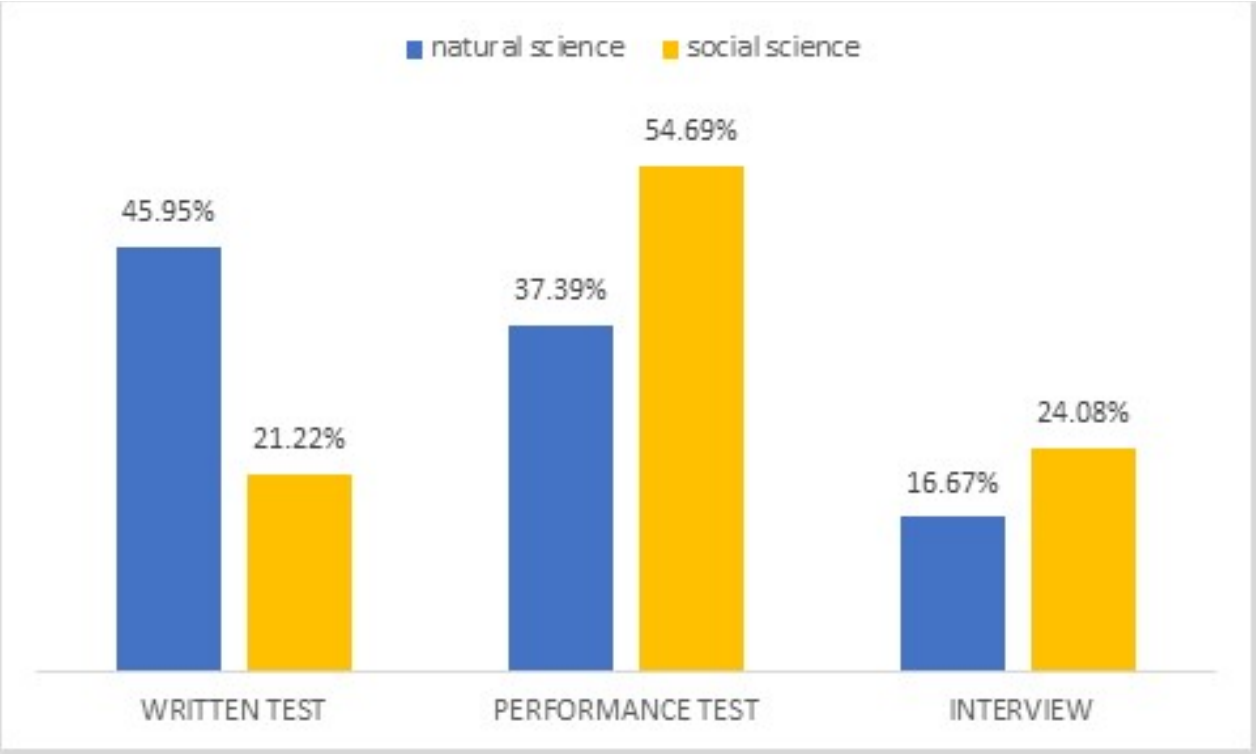

Figure 2. The form of tests conducted by lecturers in the field of natural sciences and social science.

Difficulty level: The tests carried out according to the natural lecturer are 24% higher order thinking, case or analysis questions 29%, application questions 26%, easy questions 11%, reviews 11%. While social lecturers are 21% of difficult questions (Higher Order Thinking), 36% case or analysis questions, 27% application questions, 7% easy questions, 9% reviews/reviews. Some lecturers have different views with high-complexity questions not just HOTS, no written tests, a mixture of difficult and easy questions, multiple choice to not using tests at all.

The forms of non-test assessment that are most often carried out according to natural lecturers are activeness in conducting discussions 24%, mastery of material in discussions 25%, independent tasks 28%, group assignments 23%. While social lecturers are active in conducting discussions 25%, mastery of material in discussions 24%, independent assignments 27%, group assignments 24%, and the rest the level of attendance in class, self-reflection, projects, individual assignments, peer assessment, ethics, discipline, attitude, etc.

Meanwhile, for the written test, the level of implementation of the questions given are 56.6% higher order thinking questions, 82.7% case or analysis questions, 66.1% application questions, questions are classified as easy 24.7%, reviews/reviews 0.3%. Higher order thinking skills (HOTS) are an important aspect in the education system and are very good if they can be applied in authentic assessment [27,28]. Unfortunately, only 56.6% of lecturers have used questions with the HOTS difficulty level, the rest are mostly applied and analyzed. Meanwhile, the types of non-test assessments that are often carried out by lecturers are activeness assessments and discussions. Changing the testing and assessment practices is a long process that requires enormous effort from lecturers. The courage to try something new and to actively change their behavior and beliefs could be done; they are well motivated if there is a clearly defined theoretical basis [29].

The form of the assessment carried out by the Lecturer of the State University of Malang turned out to have a difference between the natural sciences and the social sciences. The implementation of the form of test assessment is mostly carried out by the natural sciences field, while the social science field mostly conducts non-test assessments. As seen in Table 3, there is a significant difference between natural sciences and social sciences in the form of non-test assessments.

Table 3. The difference between natural sciences and social sciences in the form of non-test assessments.

Chi-Square Tests					
	Value	**Df**	**Asymptotic Significance (2-Sided)**	**Natural Sig. (2-Sided)**	**Natural Sig. (1-Sided)**
Pearson Chi-Square	7723 [a]	1	0.005		
Continuity Correction [b]	6129	1	0.013		
Likelihood Ratio	11.852	1	0.001		
Fisher's Natural Test				0.004	0.003
Linear-by-Linear Association	7697	1	0.006		
N of Valid Cases	296				

[a]. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.58. [b]. Computed only for a 2 × 2 table.

In addition, the application of the high order thinking question has a difference. Natural science applies more questions to high order thinking than in the field of social science. As seen in Table 4.

Table 4. The difference application of high order thinking question.

Chi-Square Tests					
	Value	**Df**	**Asymptotic Significance (2-Sided)**	**Natural Sig. (2-Sided)**	**Natural Sig. (1-Sided)**
Pearson Chi-Square	10.215 [a]	1	0.001		
Continuity Correction [b]	9459	1	0.002		
Likelihood Ratio	10.378	1	0.001		
Fisher's Natural Test				0.002	0.001
Linear-by-Linear Association	10.181	1	0.001		
N of Valid Cases	296				

[a]. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 49.25. [b]. Computed only for a 2 × 2 table.

3.2. Assessment Technique

The assignments given by the lecturers consist of individual assignments and group assignments. The individual assignments that are most often carried out according to lecturers are making 48% summaries, making 55.4% papers, making 51.7% articles, doing 53% questions, 8.4% making books, and the others are reviews, product design, case analysis, making applied examples, essay projects, making presentations, making modules and learning media, case studies, answering questions, analysis/case studies, analyzing cases, making vlogs or video programs, practicing maps, preparing presentations, analyzing articles, making research proposals, making videos, compiling mind maps related to the material, and reporting reading results.

Table 5 shows that individual assignments in the form of writing articles have a real difference between social sciences and natural sciences. The field of social sciences gives more individual assignments in the form of making articles when compared to the field of natural sciences.

Table 5. The difference of individual assignments in the form of writing articles.

Chi-Square Tests					
	Value	**Df**	**Asymptotic Significance (2-Sided)**	**Natural Sig. (2-Sided)**	**Natural Sig. (1-Sided)**
Pearson Chi-Square	9808 [a]	1	0.002		
Continuity Correction [b]	9072	1	0.003		
Likelihood Ratio	9915	1	0.002		
Fisher's Natural Test				0.002	0.001
Linear-by-Linear Association	9775	1	0.002		
N of Valid Cases	296				

[a]. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 53.06. [b]. Computed only for a 2 × 2 table.

Meanwhile, the group assignments that are most often done according to natural science lecturers make 24% summaries, 76.6% papers, 41.4% articles, 27.8% project books, 11.9% reading reports, and so on. The assignments are group analysis, working on a project, review and presentation, working on a group project, social service projects and case studies, field measurements, discussions and performance observations/field visits, and project analysis/case studies.

From several assignment techniques that have been carried out by lecturers, the forms of assessment that can provide real experience to students according to lecturers are project assignments 78%, portfolio assignments 42%, case study assignments 72.6%. Other assignments that are considered to provide real experience to students are writing reflection textbooks, teaching skills tests, and observations.

In addition, in implementing the assessment, as many as 54.41% of respondents from natural science lecturers have carried out assignments that can assist students in obtaining, changing or developing skills, attitudes, ideals, appreciations, and knowledge. Meanwhile 41.18% rarely, 4.41% sometimes, and 0% never. Meanwhile, social science lecturers have carried out assignments that can assist students in obtaining, changing, or developing skills, attitudes, ideals (aspirations), appreciations (awards), and knowledge (knowledge) by 63.74%. Meanwhile 41.18% rarely, 4.41% sometimes, and 0% never (Figure 3). There is no difference in the application of the assessment in the two fields of science.

3.3. Assesment Component

A good assessment should be able to measure the ability of students as a whole. Authentic assessment is considered to be able to provide information that cognitive, affective, and psychomotor aspects can measure and assess students' abilities holistically. Assessment components that are relevant to current topics in the student learning environment in accordance with the lecturer's implementation are the assessment of cognitive aspects (knowledge) 91.9%, assessing affective aspects (attitudes) 86.6%, assessing psychomotor aspects (skills) 84.7%. Several lecturers gave different responses by mentioning that the assessment should be comprehensive, peer assessment, analytical ability, and social and spiritual competence should be aspects of the assessment. When viewed from the percentage of answers from respondents, all assessment components have an implementation rate of more than 80%, meaning that 80% of lecturers have carried out a holistic assessment related to relevance to the latest topics in the student learning environment.

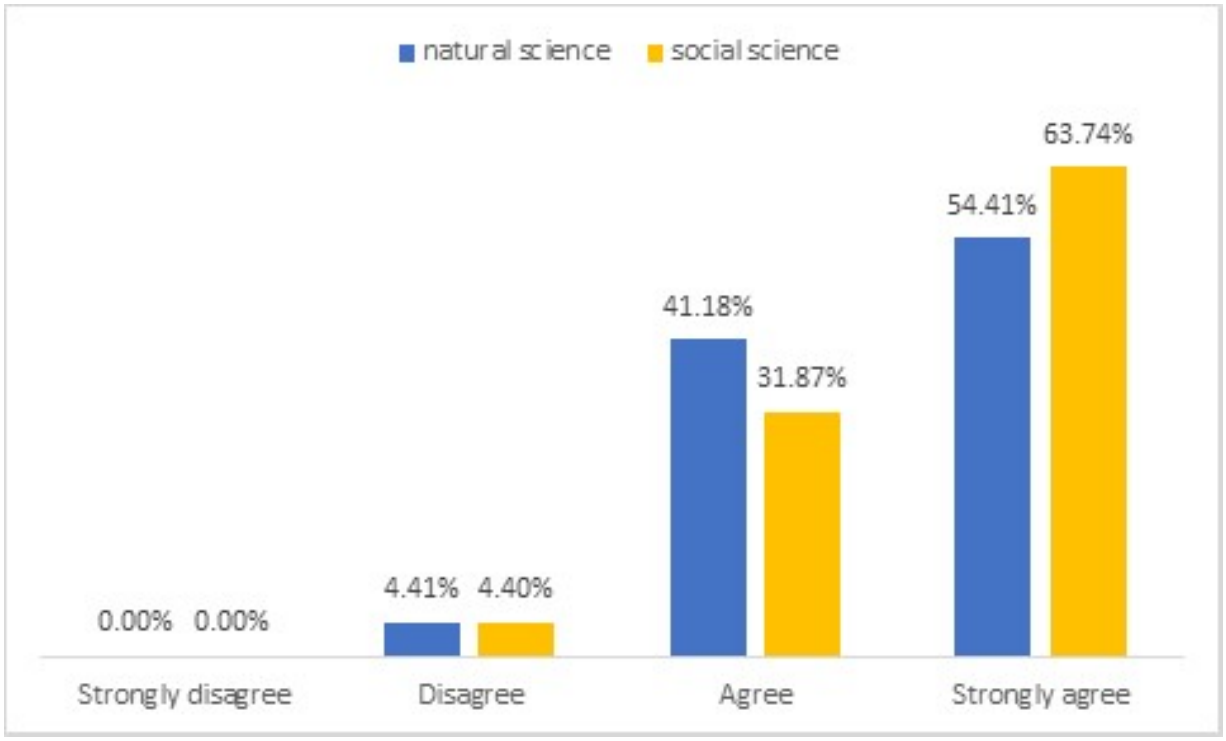

Figure 3. Implementation of assignments that can assist students in obtaining, changing, or developing skills, attitudes, ideals, appreciations, and knowledge.

3.4. Post-Assesment

The post-assessment process that has been carried out shows that as many as 45.90% of respondents lecturers of natural science provide feedback (discuss) on the results of the assessments that have been carried out, while 49.18% rarely, 4.92% sometimes, and 0% never. While the social sciences lecturer gave feedback (discussed) on the results of the assessment that had been done as much as 43.24%, while 50.00% rarely, 5.41% sometimes, and 1.34% never (Figure 4).

The follow-ups that were carried out were discussion by lecturers (one way) for 46.6%, joint discussion (FGD) for 72.6%, 33.4% of enrichment assignments, personal comment, in-class discussion, review, self-assessment, improvement of results using new assignments with higher level, discussion and questions and answers.

In the post-assessment, the majority of lecturers rarely provide feedback to students. If any, the form of follow-up that was performed would be collective discussion, one-way discussion by lecturers, and provision of enrichment. This situation should be a concern and evaluation material following the implementation scale as stipulated in the Regulation of the Minister of National Education No. 35 of 2010, a scale below 40% indicates that implementation is still not maximal [8]. The development of educational material that could be initiated through the students' opinions during the feedback process [29]. In relations to the three factors of problem-based learning, authentic assessment, and meaningful systems that are a combination of powerful tools in online learning, can provide education to students in effective digital learning [26].

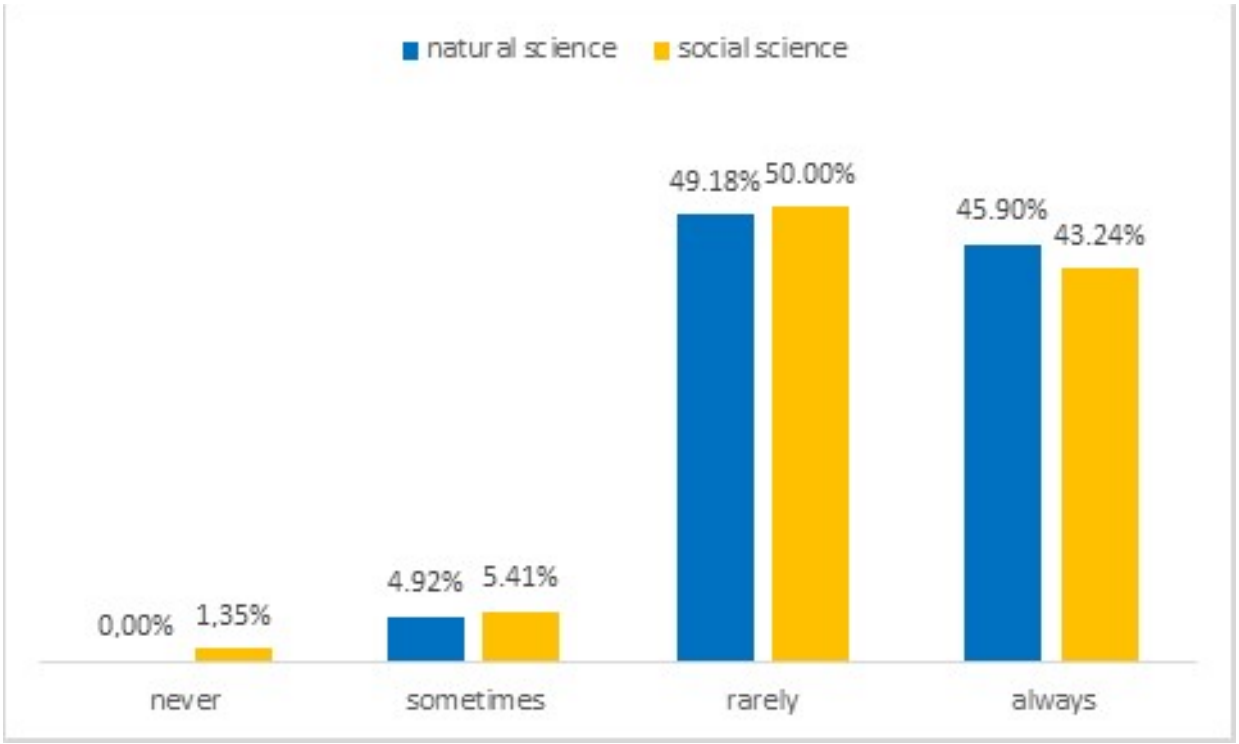

Figure 4. Lecturers provide feedback on the results of the assessments that have been carried out in the field of natural sciences in the field of social sciences.

Through the collected data, it can be seen that almost all aspects of authentic assessment between the natural and social sciences had no differences. In relation with the opinion that stated that social objects are not the same as natural objects; however, it should not leave us with the view that reality interacts with constructs in certain domains and specific sciences [14,30]. The only differences are in the form of assessment and individual assignment techniques, as shown in Table 6. Social science conducts more non-test assessments than natural science. This is understandable because sometimes, social objects are not definite and not measurable things so that a test assessment that contains specific parameters cannot be used in some areas of social science. Humanities and social sciences, in this respect, appear to be more complicated than chemistry and physics [31]. Actually, in both the social and natural sciences, there are seven steps for optimal use of portfolio assessment: (1) planning, (2) preparation for the study, (3) collecting evidence, (4) monitoring progress, (5) improving performance, (6) reflection, and (7) displaying works [32,33].

Measured tests are more widely used in the field of natural science using higher-order thinking skill questions. The use of HOTS questions in several previous studies had a significant effect on students' learning, competence, and science process skills [28,34]. Individual assignments in the form of writing articles are more widely used in social science concerning the learning outcome demands of multiple portfolios [35,36]. Both methods of assessment can be used, although not all problems in the natural and social sciences can be generalized. In practice, it would be better if an interdisciplinary approach is used [37,38], and a mixed assessment form could be used in this model.

Table 6. Types of natural and social science assessment.

Factor	Natural	Social
Assessment Form	• Written assessment (essay) • Performance assessment • Project assignment • Analysis of published research • Observation • Drawing • Multiple assessments	• Written assessment (essay) • Case studies • Class discussion • Conducting critical analysis of film shows • Fieldwork • Analysis of published research • Oral/verbal debate
Post-assessment	• Discussion of assessment results • Material enrichment • A focused discussion (FGD) • Discussion and questions and answers • Product revision • Feedback (written) • Critical analysis review	• Peer-assessment • Self-assessment • A focused discussion (FGD) • Feedback (written)

The contextual nature of critical thinking is a concept, its complex interactions with disciplinary knowledge approaches, and diverse and complex epistemologies, for assessors of critical thinking for pedagogy, curriculum, and assessment [39,40]. All scientific fields can ultimately use the implementation of authentic assessment, but it must be adapted to the epistemology and conform the learning outcomes in its application.

Figure 5 shows the proposed authentic assessment model for natural science. The abbreviation AF refers to authentic form, and PA refers to post-assessment. Based on the model, the assessments are performed sequentially. However, the instructor has an option if the next section is not required, then it can skip to the next one. It aims to make an assessment quickly and efficiently.

Figure 6 illustrates the proposed authentic assessment model for social science. The illustration represents that the assessment in social science tends to be more flexible. In other words, the instructor has free control to perform a first assessment that relates and is suitable to learning conditions. Moreover, 20 lecturers from each field study have validated these two models so that it can be implemented in the learning activities.

The results of this study are useful for academia because they can provide an overview of how lecturers in the social and natural science fields translate learning goals that might be achieved in teaching students using the PBK approach, what authentic tasks they choose to teach, how to use them to improve the quality of the process and subsequent learning outcomes, and what follow-up was provided regarding each of the authentic assessments used. The results of this study are useful for the professional world because they can provide a foundation and inspiration to conduct more in-depth research in their respective fields, according to existing interests and needs.

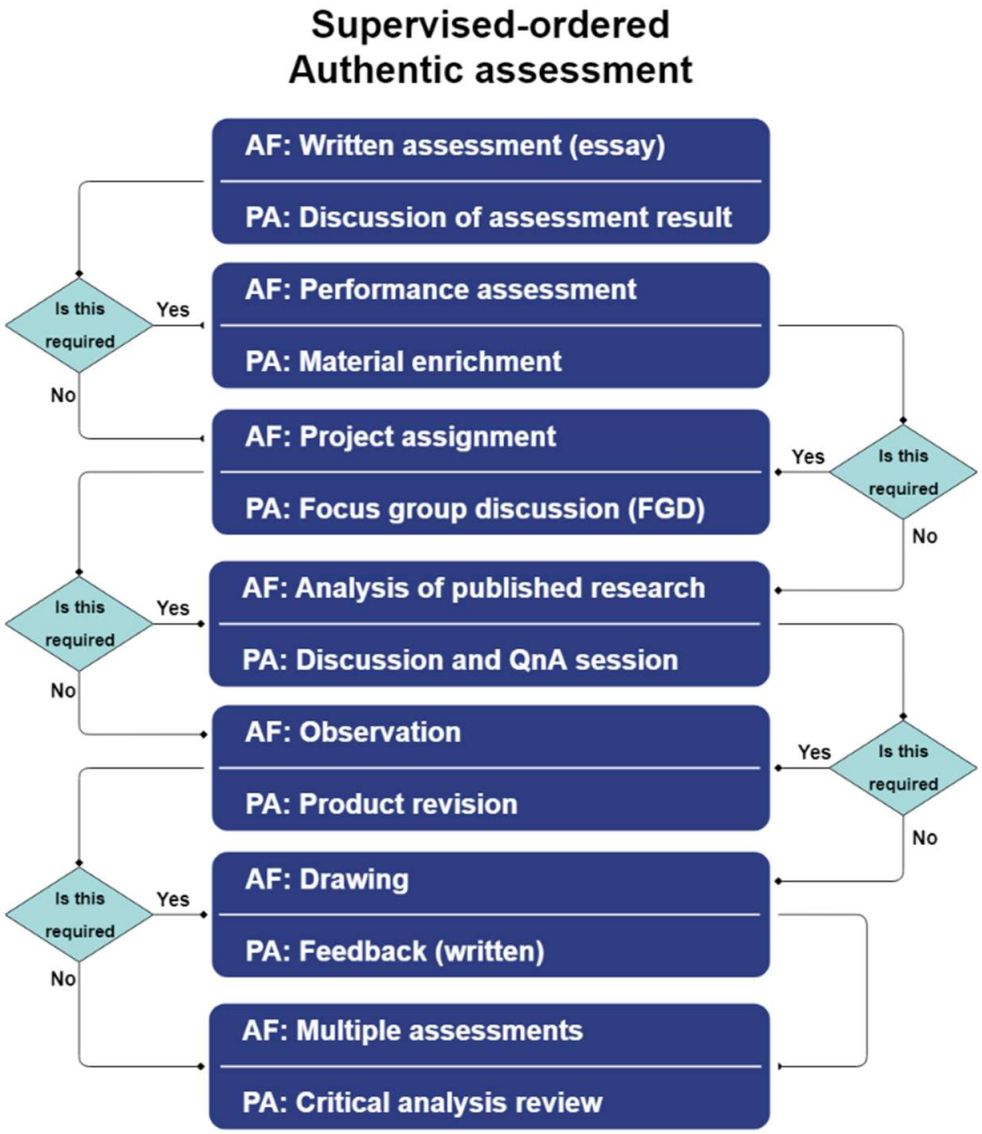

Figure 5. The proposed authentic assessment model for natural science.

The contribution of research results to the academic world related to authentic assessments include: (1) the process of seeking and finding information in the learning process, (2) the basis for making judgments, decisions, conclusions from an evaluation, (3) providing direct meaning in the educational process, for example real in biology learning that uses a process approach, while the contribution of research results to the professional world related to authentic assessments include: (1) authentic assessment known as performance assessment is a form of assessment that emphasizes professional performance related to the actual situation, (2) can know the attitude of professionals as expected, (3) allow to measure professional skills in a complex manner, and (4) enable the professionals being assessed to demonstrate their abilities in a real context.

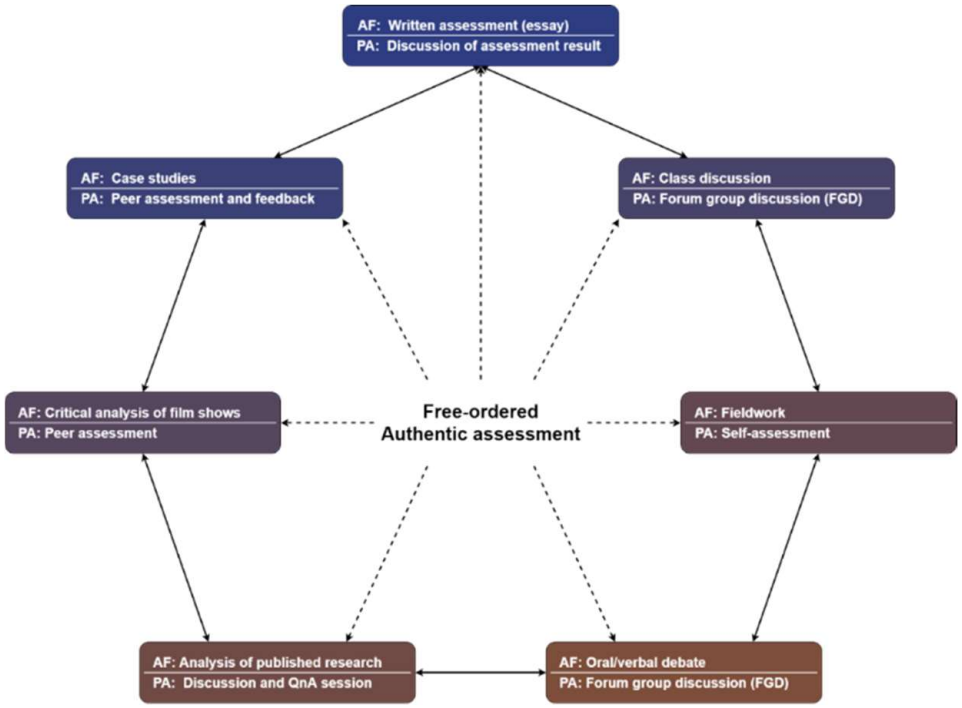

Figure 6. The proposed authentic assessment model for social science.

The comparison between authentic assessments used in the social and natural science fields is useful as a source of information regarding various kinds of authentic assessments that can be used by each field of science. However, the use of this authentic assessment must still be adjusted to the learning objectives and the type of task chosen in achieving the goals to be achieved.

The benefits of authentic assessment research for other researchers are (1) it can be used as an effort to develop assessments that aim to assess individual abilities through certain tasks, determine learning needs, help and encourage students and educators (teachers) to become better at determining learning strategies, institutional accountability, and improving the quality of learning, while further research is required in (1) finding obstacles in conducting comprehensive, holistic, and consistent assessments, and (2) finding solutions in overcoming difficulties in improvising/developing valid and reliable research instruments.

4. Conclusions

In conclusion, almost all aspects of authentic assessment between the natural and social sciences had no difference. The only differences were in the assessment form and individual assignment techniques that were performed. Social science conducted non-test assessment only higher than the natural science. Measured tests were primarily used in the natural science using higher-order thinking skills questions. Performance test was mostly conducted in social science. Further research is needed to identify following assessment model form particularly in higher education sample that could not give response as an accountability form of authentic assessment implementation that is more specific, holistic, comprehensive in a scientific cluster following the expert group.

Author Contributions: Data curation, E.S. and H.S.; investigation, N.A.M.J.; methodology, E.S.; project administration, E.S.; resources, S.N.R.; validation, A.P.W.; writing—original draft, E.S. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Ethical review and approval were waived for this study, due to reason that all students had agreed to participate in this study.

Informed Consent Statement: All of the participants stated their informed consent to participate in the study before doing the research.

Data Availability Statement: The data is available.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Pade, H.; Ingram, P.; Wright, A.J. *Teaching and Supervising Assessment beyond COVID-19*; Division 12 (Clinical Psychology) of the American Psychological Association: New York, NY, USA, 2020.
2. *International Baccalaureate Organization, Online Learning, Teaching and Education Continuity Planning for Schools*; International Baccalaureate Organization (UK) Ltd.: Cardiff, UK, 2020.
3. Olfos, R.; Zulantay, H. Reliability and validity of based course. *Educ. Technol. Soc.* **2007**, *10*, 156–173.
4. Kinay, I.; Bagceci, B. The Investigation of the Effects of Authentic Assessment Approach on Prospective Teachers' Problem-Solving Skills. *Int. Educ. Stud.* **2016**, *9*, 51. [CrossRef]
5. Susani, R.G. The Implementation of Authentic Assessment in Extensive Reading. *Int. J. Educ.* **2018**, *11*, 87. [CrossRef]
6. Abdullah, A.G.; Aryanti, T.; Setiawan, A.; Alias, M.B. *Regionalization and Harmonization in TVET*; Taylor & Francis: London, UK, 2017.
7. Wangid, M.N.; Mustadi, A.; Senen, A.; Herianingtyas, N.L.R. The evaluation of authentic assessment implementation of Curriculum 2013 in Elementary School. *J. Penelit. Dan Eval. Pendidik.* **2017**, *21*, 104–115. [CrossRef]
8. Suarimbawa, K.A.; Marhaeni, A.A.I.N.; Suprianti, G.A.P. An Analysis of Authentic Assessment Implementation Based on Curriculum 2013 in SMP Negeri 4 Singaraja. *J. Educ. Res. Eval.* **2017**, *1*, 38–45. [CrossRef]
9. Idham, F.I. The Use of Authentic Assessment in English Writing Skill to The Eleventh Grade Students. *e-J. Engl. Lang. Teach. Soc. (ELTS)* **2015**, *3*.
10. Rizavega, I.H. Authentic Assessment Based on Curriculum 2013 Carried by EFL Teacher. *J. Profesi Kegur.* **2018**, *4*.
11. Ardianti, T.M.; Mauludin, L.A. Students' Responses on the Application of Authentic Assessment in EFL Reading Class. *J. Engl. Lang. Lit. Teach.* **2017**, *1*.
12. Kearney, S.; Perkins, T.; Clark, S.K. Using self- and peer-assessments for summative purposes: Analyzing the relative validity of the AASL (Authentic Assessment for Sustainable Learning) model. *Assess. Eval. High. Educ.* **2016**, *41*, 840–853. [CrossRef]
13. Ingthorsson, R.D. The Natural Vs. The Human Sciences: Myth, Methodology and Ontology. *Discus. Filosóficas* **2013**, *14*.
14. Persson, J.; Hornborg, A.; Olsson, L.; Thorén, H. Toward an alternative dialogue between the social and natural sciences. *Ecol. Soc.* **2018**, *23*. [CrossRef]
15. Milanez, B. Dialogues between social and natural sciences: Contribution to the debate on socio-environmental conflicts. *Acad. Bras. Cienc.* **2015**, *87*, 2335–2348. [CrossRef]
16. Kagan, J. *The Tree Cultures: Natural Sciences, Social Sciences, and the Humanities in the 21st Century*; Cambridge University Press: New York, NY, USA, 2009.
17. Borg, W.R.; Gall, J.P. *Educational Research Introduction*, 6th ed.; Longman Publishers: White Plains, NY, USA, 1996.
18. Creswell, J.W. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 4th ed.; SAGE Publications: New Delhi, India, 2014.
19. Alam, M. Selection of the Samples with Probability Proportional to Size. *Sci. J. Appl. Math. Stat.* **2015**, *3*, 230. [CrossRef]
20. Wright, T. Probability proportional to size (πps) sampling using ranks. *Commun. Stat. Theory Methods* **1990**, *19*, 347–362. [CrossRef]
21. Pandis, N. The chi-square test. *Am. J. Orthod. Dentofacial. Orthop.* **2016**, *150*, 898–899. [CrossRef]
22. Ottenbacher, K.J. The chi-square test: Its use in rehabilitation research. *Arch. Phys. Med. Rehabil.* **1995**, *76*, 678–681. [CrossRef]
23. Franke, T.M.; Ho, T.; Christie, C.A. The Chi-Square Test. *Am. J. Eval.* **2011**, *33*, 448–458. [CrossRef]
24. Fitriani, F. Implementing Authentic Assessment of Curriculum 2013: Teacher's Problems and Solusions. *Getsempena Engl. Educ. J. (GEEJ)* **2017**, *4*, 217656.
25. Darma, I.K.; Candiasa, I.M.; Sadia, I.W.; Dantes, N. The Effect of Problem Based Learning Model and Authentic Assessment on Mathematical Problem Solving Ability by Using Numeric Ability as the Covariable. *J. Phys. Conf. Ser.* **2018**, *1040*, 012035. [CrossRef]
26. Litchfield, C.B.; John, V.D. Authentic Assessment of Knowledge, Skills, and Attitudes. In *New Directions for Teaching and Learning*; Wiley: Hoboken, NJ, USA, 2015.
27. Mohamed, R.; Lebar, O. Authentic Assessment in Assessing Higher Order Thinking Skills. *Int. J. Acad. Res. Bus. Soc. Sci.* **2017**, *7*, 466–476.
28. Haryati, B.M.; Gultom, T. The Effect of Learning Model on Higher Order Thinking and Student Science Process Skills in Ecology. *Int. J. Humanit. Soc. Sci. Educ.* **2017**, *4*, 150–155.
29. Hus, V.; Matjašič, J. Evaluation and Assessment in Early Social Science. *Univers. J. Educ. Res.* **2017**, *5*, 664–670. [CrossRef]
30. Montuschi, E. ShouldWe Still Compare the Social Sciences to the Natural Sciences? *Sociologica* **2008**.
31. Jaffe, K. Social and natural sciences differ in their research strategies, adapted to work for different knowledge landscapes. *PLoS ONE* **2014**, *9*, e0113901. [CrossRef]

32. Srikaew, D.; Tangdhanakanond, K.; Kanjanawasee, S. Development of an English Speaking Skill Assessment Model for Grade 6 Students by Using Portfolio. *Soc. Behav. Sci.* **2015**, *191*, 764–768. [CrossRef]
33. Setiawan, D. Authentic Assessment Model In Social Studies Learning To Improve The Social Skills. *Turk. Online J. Des. Art Commun.* **2017**, *7*, 1393–1403.
34. Mahzum, E. Making Analysis of Higher Order Thinking-Based Objective Test at State Junior High School 5 Banda Aceh. *J. Phys. Conf. Ser.* **2018**, *1116*, 032018. [CrossRef]
35. Alleman, J. Authentic Assessment in Social Studies. *HSSE Online* **2012**, *1*, 7–26.
36. Martin, A.; Arrambide, M.; Holt, C. The Impact of Flipped Instruction on Middle School Mathematics Achievement. *J. Educ. Hum. Dev.* **2016**, *5*. [CrossRef]
37. Lowe, P.; Phillipson, J.; Wilkinson, K. Why social scientists should engage with natural scientists. *Contemp. Soc. Sci.* **2013**, *8*, 207–222. [CrossRef]
38. Barthel, R.; Seidl, R. Interdisciplinary Collaboration between Natural and Social Sciences—Status and Trends Exemplified in Groundwater Research. *PLoS ONE* **2017**, *12*, e0170754. [CrossRef] [PubMed]
39. Nicholas, M.C.; Labig, C.E., Jr. Faculty Approaches to Assessing Critical Thinking in the Humanities and the Natural and Social Sciences Implications for General Education. *J. Gen. Educ. A Curric. Commons Humanit. Sci.* **2013**, *62*. [CrossRef]
40. Morris, R.V. Drama and Authentic Assessment in a Social Studies Classroom. *Soc. Stud.* **2001**, *92*, 41–44. [CrossRef]