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A Comparison between Collaborative and Individual Writings in Promoting Motivation and Language Acquisition

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Received: 6 September 2020; Accepted: 24 September 2020; Published: 25 September 2020

Abstract: The study refers to collaborative writing. The main objective of this study is to show the effects of collaborative writing in the acquisition of the English language upon students of non-compulsory secondary education. The applied study is grounded on a quantitative focus of correlational character and descriptive basis, while applying a quasi-experimental design with a control group (CG) and an experimental group (EG). The results show that there is a significant relation that favors the method of collaborative writing upon the dimensions of feedback, motivation, collaboration, satisfaction, and ratings. It can be concluded that the collaborative writing method is effective if compared to the individual learning method.

Keywords: acquisition; cooperative method; collaborative writing; individual writing; innovative teaching and learning methods

1. Introduction

According to a study [1], second language writing (hereinafter, L2W) is a potential source for language acquisition and learning. The author relates this to a researcher [2] who argued that writing enables learners to analyze and consolidate second language (hereinafter, L2) knowledge. Students focus on the relationship between form and meaning, and, consequently, work in order to express their ideas by using language in the most accurate way possible [3]. This author found that in writing tasks, a "type of linguistic processing" takes place, which is an important source for second language learning (hereinafter, SLL). Such linguistic processing has been argued to be effective in the uptake of the L2 as it has been found that participants pay attention to language forms as well as content. As a result, they reflect on, discuss, and acquire language knowledge. Moreover, when done collaboratively, students may discuss a wider range of linguistic language aspects which can be a source for language development.

The development of innovative educational methods entails efforts and sacrifices by those implied in the processes of teaching and learning, both by the organization of the schools [4], and the teachers [5]. Diverse pedagogical proposals that allow the improvement of students' performance exist [6–11]. Among such proposals, cooperative methods are found. In recent times, such methods are flourishing successfully in allowing the acquisition of didactic contents [12] due to their pedagogical potential [13].

Cooperative learning can be developed amongst groups of two or more people [14] who share didactic resources [15]. It must be highlighted that all individual actions play a role in the final

outcome of tasks [16]. Therefore, this pedagogical action requires sharing all of the abilities which the members forming the group possess [17] in order to acquire the proposed curricular elements [18]. The present teaching method gives students the opportunity to exchange experiences [19] and roles [20]. Notwithstanding this, in order to develop the cooperative method, a group project [21], group problem-solving [22], and debates [23] are required.

Regardless of the fact that it is a teaching method that is currently having great impact, when it comes to bringing it into practice, positive results are not always found [24]. The reason lies in the fact that pedagogical training for both teachers [25] and students themselves is required [26]. Added to this, as in all teaching methods, diverse inconveniences exist, upon which, most significantly, the lack of group commitment can be found [27].

Interestingly, this type of teaching method is normally positively viewed by students [28,29], due to the fact that it improves interactions and contact with teachers [30,31], promotes communication amongst equals [32], motivation [33], community membership [34], the development of activities [35], interest [36], autonomy [37], and an active participation in the process of learning [38].

In order to develop the method of collaborative writing (hereinafter, CW), the cooperative method is essential [39]. In the last decades, CW has been widely used in the field of English and all other foreign language learning. Moreover, it has been developed through diverse means [40], upon which the technological method stands out [41,42]. The proliferation of this method is due the potential benefits of acquiring a second language [43]. Furthermore, various studies have shown that it can be developed in different educational periods [44]. Moreover, it has high linguistic potential as it improves students' composition skills [45]. Nevertheless, specific training by teachers is required, so as to allow the effective development and outcome of the method [46]. Among aspects which enable the improvement of the method, an increase in interaction between students [32], collaboration levels in the development of the task [47], qualifications [48], satisfaction rates [49], and motivation [50] can be found.

In addition, it can be indicated that the application of collaborative teaching methods promotes sustainability [51]. An example of this is the European Project Semester (EPS) programme, which encourages multidisciplinary and multicultural teamwork and increases the ability to communicate, problem-solve, creativity, etc. [52]. The collaborative learning method has been implemented in a variety of contexts [53–55].

2. Rationale and Objectives of the Study

New tendencies in the educational scope are leading to the development of new pedagogical proposals which enable the improvement of teaching and learning processes, and consequently, students' academic development [56].

The present study presents a pedagogical method based on CW for language acquisition, while promoting new and innovative pedagogical actions in the acquisition of the written expression [39] among students enrolled in the second year of non-compulsory secondary education (hereinafter, NCSE). Furthermore, it is intended to promote the development of further studies regarding this writing method [40–44], by following the same methodological process developed in other studies [57,58].

In addition, the present study primarily aims to collect data and evidence about the positive effects of CW on the acquisition of the English language by students of second year of NCSE. Drawing from this general objective, a set of more specific objectives are developed: (a) obtain feedback from students' perceptions and opinions regarding CW; (b) identify the level of motivation students feel when engaged in CW; (c) test the levels of collaboration students feel takes place when developing the CW task; (d) discover the level of satisfaction students find from the proposed pedagogical actions; (e) learn about student´s self-evaluation level in the development of the proposed teaching and learning process; and (f) identify the influence of CW on students' qualifications.

3. Methodology

3.1. Research Design

The applied study is based on a quantitative approach of correlational character and descriptive basis [59]. A quasi-experimental design was applied for both a control group (CG) and an experimental group (EG) by taking into account previously developed studies which follow a similar structure [57,58]. The students were divided into two groups. The CG developed a pedagogical experience based on individual writing (IW), and the EG developed one based on CW (Table 1). The sampling technique has been applied based on reasons of convenience due to the fact that, unfortunately, it was not possible to be done randomly.

Table 1. Group composition.

Group	*n*	Composition	Pretest	Treatment	Posttest
1. Control	32	Natural	-	X	O_1
2. Experimental	35	Natural	-	X	O_2

In addition to this, two types of study variables have been defined. The dependent variable, making reference to the effects generated in the dimensions, and the independent variable, being based on the writing method developed for the acquisition of the English language. Data collection took place at the end of the pedagogical process, by applying a design solely based on post-test.

3.2. Participants

As previously mentioned, the present study was developed by a sample from convenience, composed of 67 students. Such students were enrolled in the second year of NCSE. Moreover, the students have a background of Spanish–English bilingual education. It must be signaled that, from previous studies, it has been found that the size of the sample is not a determining element in order to develop educational experiences, and, as such, any concerning studies [60,61].

The students of second year of NCSE were enrolled in an educational center located in the south of Spain. The sampled students consist of 56.72% of females and 43.28% of males whose ages range between 17 and 18 years (M = 17.3; SD = 0.385). It must be added that they come from a medium-high socioeconomic and cultural level.

The educational experience was developed at the end of the academic year of 2018–2019 for the students of the second year or NCSE, between the months of May and June. It must be acknowledged that the students were very collaborative. Moreover, they were informed at all times about the objectives and purposes of the study. Added to this, all corresponding permissions were collected in order to allow the accurate development of the study. In this particular case, no students denied their participation in the study.

3.3. Instrument

The instrument used is an ad hoc questionnaire, based on the one developed previously [62]. It was developed by taking into account those used in other studies which share characteristics with the present study related to the analysis of feedback [63], motivation [64], collaboration [65], course satisfaction [66], and the students´ self-evaluation [67]. Furthermore, previous qualifications given to the students by teachers were also taken into account.

The questionnaire consists of 7 dimensions (socio-educational, feedback, motivation, collaboration, course satisfaction, ratings, and teacher-ratings) with a total of 33 items, based on the Likert response scale of 5 points, one being completely disagree and five, completely agree.

In order to validate the instrument, the Delphi qualitative validation method was used throughout the assessment by 10 experts. Such assessment was positive (M = 4.31; DS = 0.25; min = 1; max = 5).

Furthermore, it developed the statistical process based on Kappa of Fleiss and W Kendall, which both presented suitable indicators (K = 0.81; W = 0.82). This was followed by a validation through an exploratory factorial analysis with varimax rotation (Bartlett = 2749.21; $p < 0.001$; Kaiser–Meyer–Olkin = 0.89), which presented positive values. Finally, Cronbach's alfa (0.871) and the omega method by McDonald (0.866), which also presented positive values, were applied. All reached values have proven that the applied instrument is valid and reliable (Appendix A).

3.4. Dimensions of the Study

In order to identify the acquired values in the study, diverse dimensions of studies have been determined. Such dimensions, based upon previous studies [62–65,67], make reference to:

- Feedback: Analyze equity, utility, and students´ acceptance of the applied educational method.
- Motivation: Identify self-efficacy and the scale of values in the development of tasks.
- Collaboration: Determine the levels of collaboration developed and applied between students themselves.
- Course satisfaction: Learn about students´ satisfaction towards the development of the educational experience.
- Ratings: Identify the self-evaluation which students provide themselves in the development of the teaching and learning process.
- Teacher-ratings: Establish the qualifications acquired by students based on teacher annotations.

3.5. Methodological Procedure

In order to develop the pedagogical experience and proceed to the corresponding statistical analysis, various phases were followed. To begin, the sample was selected. In this case, an educational center in the south of Spain was contacted for their voluntary participation in the pedagogical development. In exchange, the investigation team would provide them with the acquired results.

Next, two teaching and learning processes were proposed. One was a process based on the teaching of IW and, the other, of CW, developed in pairs. The pairing criteria of the students was based upon their curricular competence and adequate personal relationships, the objective being the creation of pairs which share similar qualities. This educational experience was developed in one session. Both groups engaged in the same content and task, based on an opinion essay as it provides students with the opportunity to reflect on and discuss a wide range of ideas which they should try to accurately convey in the final writing. Gender inequalities was the topic used.

Once the session had finalized, all data was collected through the questionnaire which had been previously validated. This was followed by the recollection of data which was dealt with and adapted to the statistical program so as to determine the results acquired and reach the final conclusions on the effectiveness of CW.

3.6. Data Analysis

The statistical study was developed through the IBM SPSS Statistics 25.0 program. For the descriptive analysis, the statistics of mean (M), typical deviation (TD), asymmetry (A_{me}), and kurtosis (K_{me}) were used. The T-students test was used to develop the mean comparison. In order to determine the differences between the means for the EG and the CG, the T-students test was used for independent samples. In both cases, the values below $p < 0.05$ were considered as significant means, in addition to the t ($t_{n1+n2-2}$), Cohen's d and biserial correlation (r_{xy}) statistics.

4. Results

The data provided by the students of the second year of NCSE, for the descriptive analysis, shows differences between the study groups. The distribution of the sample is normal due to the fact that the values of asymmetry and kurtosis are found between ±1.96 [68]. The CG shows a mean located at

2.2 for the majority of its dimensions, with the exceptions of ratings and teacher-ratings which are located at 2.5. Interestingly, the EG offers higher means for all dimensions. Such dimensions have been found to be located around 3.4, with the exceptions of ratings and teacher-ratings, which are located at 3.2. If the typical deviation is taken into consideration, a wide range of diverse answers from the students, for both the CG and EG, are found. This shows that there is no tendency among students to respond to the educational experience developed. The kurtosis is platykurtic in all dimensions of the study, for both the CG and EG (Table 2).

Table 2. Results achieved for the dimensions of the study by the control group (CG) and the experimental group (EG) of second year of non-compulsory secondary education.

		Likert Scale *n* (%)					Parameters			
	DIM	**1**	**2**	**3**	**4**	**5**	**M**	**SD**	$\mathbf{S_{kw}}$	$\mathbf{K_{me}}$
CG	FBA	11 (34.4)	9 (28.1)	5 (15.6)	5 (15.6)	2 (6.2)	2.31	1.28	0.64	−0.71
	MOT	12 (37.5)	7 (21.9)	7 (21.9)	5 (15.6)	1 (3.1)	2.25	1.21	0.51	−0.91
	COL	14 (43.8)	8 (25)	4 (12.5)	3 (9.4)	3 (9.4)	2.16	1.34	0.96	−0.24
	SAT	12 (37.5)	9 (28.1)	6 (18.8)	3 (9.4)	2 (6.2)	2.19	1.23	0.84	−0.16
	RAT [a]	8 (25)	9 (28.1)	7 (21.9)	5 (15.6)	3 (9.4)	2.56	1.29	0.42	−0.85
	TER [a]	7 (21.9)	10 (31.2)	6 (18.8)	5 (15.6)	4 (12.5)	2.66	1.33	0.42	−0.94
EG	FBA	3 (8.6)	6 (17.1)	9 (25.7)	8 (22.9)	9 (25.7)	3.40	1.28	−0.29	−0.95
	MOT	2 (5.7)	6 (17.1)	11 (31.4)	6 (17.1)	10 (28.6)	3.46	1.24	−0.18	−0.98
	COL	3 (8.6)	4 (11.4)	10 (28.6)	5 (14.3)	13 (37.1)	3.60	1.33	−0.46	−0.89
	SAT	4 (11.4)	4 (11.4)	12 (34.3)	4 (11.4)	11 (31.4)	3.40	1.35	−0.26	−0.98
	RAT [a]	5 (14.3)	4 (11.4)	9 (25.7)	11 (31.4)	6 (17.1)	3.26	1.29	−0.42	−0.77
	TER [a]	4 (11.4)	6 (17.1)	9 (25.7)	9 (25.7)	7 (20)	3.26	1.29	−0.25	−0.93

Note: DIM (dimensions); FBA (feedback); MOT (motivation); COL (collaboration); SAT (satisfaction); RAT (ratings); TER (Teacher-ratings); CG (Control group); EG (Experimental group). [a] Established grade group (None: 1,2; Few: 2.1–4; Enough: 4.1–6; Notable: 6.1–8; Completely: 8.1–10).

Regarding the totaled mean of the CG, it is slightly below the idealized mean as it is located below 2.5 points. However, when it comes to the EG, a slightly superior mean to the idealized mean is found. Concerning ratings and teacher-ratings, both the EG and CG do not follow the tendency of the rest of the dimensions. The CG´s means, for both ratings and teacher ratings, are found to be above the totaled mean. Interestingly, the means for ratings and teacher ratings in the EG are below the totaled mean (Figure 1).

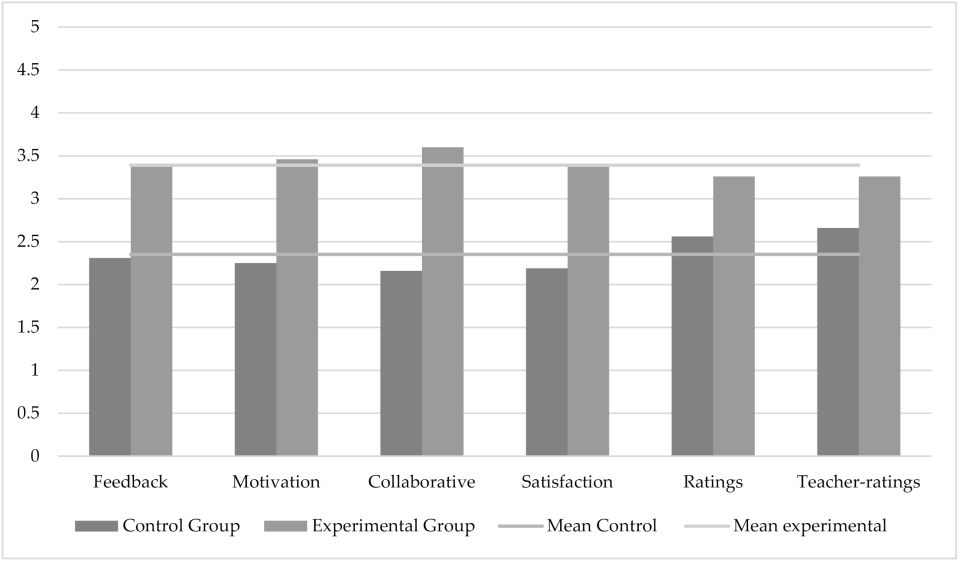

Figure 1. Comparison between the control group and the experimental group.

In order to learn about the independence group, from the data acquired from the pedagogical development of CW in contrast to the pedagogical process of IW, the statistical T-Student has been used for independent samples. The diverse results which have been found highlight that a very significant relationship in the dimensions of feedback, motivation, collaboration and satisfaction exists. Added to this, a relation of significance with ratings has been found. Nevertheless, for teacher-ratings this significant relation does not exist. The association force between the diverse dimensions shows an average relation, with an exception in ratings, where the association force is intermediate-low. The size of the effect is very low in all studied dimensions (Table 3).

Table 3. Study of the independence value between the control group and the experimental group.

Dimensions	$\mu(X_1 - X_2)$	$t_{n1+n2-2}$	df	*d*	r_{xy}
Feedback	−1.088 (2.31 − 3.40)	−3.461 **	65	0.047	0.394
Motivation	−1.207 (2.25 − 3.46)	−4.006 **	65	0.084	0.445
Collaborative	−1.444 (2.16 − 3.60)	−4.407 **	65	0.069	0.480
Satisfaction	−1.213 (2.19 − 3.40)	−3.823 **	65	0.030	0.428
Ratings [a]	−0.695 (2.56 − 3.26)	−2.198 *	65	−0.019	0.263
Teacher-ratings [a]	−0.601 (2.66 − 3.26)	n.s.	-	-	-

** Correlation is significant at level 0.01. * Correlation is significant at level 0.05. n.s. No significant. [a] Established grade group (None: 1–4.9; Few: 5–5.9; Enough: 6–8.9; Completely: 9–10).

5. Discussion

The acquisition of a L2 requires, among other aspects, the development of writing skills [1,2]. Such development often demands active and innovative teaching methods in order to achieve the established curricular elements [4,5,9–11].

Within such methods, cooperative learning can be found. Through group work, cooperative learning enables students to reach the diverse established pedagogical proposals and enhance diverse abilities that allow them to prosperously reach knowledge acquisition [14,15,17,18] Within the cooperative method, CW is found. Currently, CW is flourishing and is the pedagogical technique upon which the present study has been based.

Upon the results acquired from the present study, it has been proven that differences exist between the means provided by the students developing the pedagogical strategy of CW and those developing it through IW. This is based on the fact that the means of the CG are located below 2.5, which implies a low-intermediate marking tendency. For the CG, the most valued dimensions have been ratings and teacher-ratings. By contrast, for the EG, high-intermediate tendencies have been found as the means are located above 2.5. In addition, for the EG, the least valued dimensions have been ratings and teacher-ratings. Nevertheless, there are no significant differences with the means of the rest of the dimensions of the EG, all being in tune with that noted by [50].

It should be borne in mind that the collaborative method promotes learning in a sustainable development context, which is essential in these times [51–55].

It also shows that there is a wide dispersion of response from students who participated in the study, showing diversity of opinion in the developed studies, both in the educational experience based on CW and IW.

The total mean for the CG´s dimensions is located slightly below the idealized mean, while, for the EG, it is located above the idealized mean. For both groups, ratings and teacher-ratings have different tendencies. For the CG, they are located above the mean of the rest of the dimensions. Contrarily, for the EG, they are below the mean of the rest of the dimensions. Therefore, it is proven that a significant relation exists, favoring the method of CW, especially in the dimensions of feedback, motivation, collaboration, satisfaction, and ratings. This highlights the great impact of CW on the development of such dimensions, all of this in line with that noted by other investigators [32,44–47,49,50]. It is noteworthy that a significant relation has not been observed for teacher-ratings. This shows that, in

contrast to the results obtained by researchers [48], differences in qualifications have not been found regardless of the method being applied.

6. Conclusions

It can be concluded that the CW method is, in fact, effective when compared to the IW method, in the dimensions of feedback, motivation, collaboration, satisfaction, and ratings, with the exception of teacher-ratings.

The prospect of the present investigation is to show investigators the positive effects of the use of CW as a teaching and learning process. Moreover, it aims at presenting an innovative and effective pedagogical procedure, in order to promote its use by teachers and those who develop didactic content similar to those applied in this study. For those responsible for education policy makers related to the content worked on in this manuscript, this study can serve to offer, within the educational regulations themselves, the inclusion of active teaching methods that facilitate and promote the development of content related to writing and the acquisition of a second language. Furthermore, it is intended to show that the method applied in this research promotes the training of students to deal with sustainability.

The limitations of this study are found in various elements. To start, characteristics and peculiarities of the sampled population are very specific. Consequently, caution is required when extrapolating the data collected here for other populations. In addition, access to the population has been one of convenience, and as such, no sampling techniques could be applied in the development of the present study, due to the difficulties which exist when accessing such groups. Lastly, the method and data collection has required considerable effort by the researchers as they have had to train those teachers in charge of applying these teaching and learning methods, in addition to monitoring the process, collecting the data, and processing them for their study.

Future lines of investigation focus on developing this teaching and learning procedure in other contents, subjects, and educational stages.

Author Contributions: Conceptualization, I.B.H.; methodology, J.L.O.M.; software, A.-J.M.-G.; validation, A.-J.M.-G.; formal analysis, J.-M.T.-T.; investigation, all authors; data curation, I.B.H.; writing—original draft preparation, all authors; writing—review and editing, all authors; visualization, all authors; supervision, all authors. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

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

Appendix A

Table A1. Adaptation to Spanish of Reference [57].

Variable	Ítem	Selección
Género	Género	Hombre Mujer
Edad	Edad	17 años
		18 años
		19 años
		20 años
Contexto	¿Cuál es tu nivel socioeconómico	Bajo
		Medio
		Alto

Table A1. *Cont.*

Variable	**Ítem**				**Selección**	
Dimensión	Variable	1	2	3	4	5
Retroalimentación	Estoy satisfecho con la respuesta recibida por los compañeros					
	Considero que la retroalimentación recibida es justa					
	Considero que la retroalimentación recibida está justificada					
	Considero que la información recibida es útil					
	Considero que la retroalimentación recibida es útil					
	La retroalimentación recibida me ayudará en mi proceso formativo					
	Acepto la respuesta recibida					
	Discuto la respuesta recibida					
	No acepto la retroalimentación recibida					
Motivación	Estoy seguro de que puedo aprender bien las habilidades que se enseñan en la clase en relación a la escritura.					
	Puedo trabajar los contenidos más difíciles de escritura si lo intento					
	Puedo hacer casi todos los contenidos relacionados con la escritura si no me rindo					
	Si tengo suficiente tiempo, puedo hacer un buen trabajo en mi clase					
	Aunque los contenidos de escrita sean difíciles, puedo aprenderlo					
	Considero que aprender a escribir es importante					
	Encuentro interesante la escritura					
	Aprendo que la escritura es útil					
	Comparado con otros contenidos, la escritura es útil					
Colaboración	Mis compañeros y yo trabajamos activamente juntos para completar las tareas relacionadas con contenidos de escritura					
	Los miembros de mi grupo y yo trabajamos activamente juntos para ayudarnos a entender los contenidos de escritura					
	Recibo comentarios útiles sobre mi parte del trabajo de otros miembros del grupo					
	Mis compañeros y yo trabajamos juntos activamente para aprender nuevas cosas sobre los contenidos de escritura					
	Mis compañeros y yo compartimos activamente ideas sobre los contenidos de escritura					
Satisfacción del curso	Sentí que había logrado los elementos curriculares de este curso					
	Me gustó el formato del curso					
	Recomendaría este método de enseñanza a otros					
		0–2	3–4	5–6	7–8	9–10
Autoevaluación	¿Cuál es tu nota media en general?					
	¿Cuál es su promedio general en la asignatura de Lengua Extranjera (inglés)?					
	¿Cuál ha sido la calificación que ha obtenido en la asignatura de Lengua Extranjera (inglés) después del desarrollo de la experiencia?					
Calificación docente	Calificación del docente en la materia de Lengua Extranjera (inglés)					

Note: 1: completamente en desacuerdo–5: completamente de acuerdo

References

1. Manchón, R. Situating the learning-to-write and writing. In *Learning-to-Write and Writing-to-Learn in an Additional Language*; Manchón, R., Ed.; John Benjamins Publishing: Amsterdam, The Netherlands, 2011; pp. 3–14.
2. Cumming, A. Learning to write in a Second Language: Two Decades of Research. *Int. J. Engl. Stud.* **2001**, *1*, 1–23. [CrossRef]
3. Rodríguez-García, A.M.; Mora, M.A.; Moreno-Guerrero, A.J. Scientific evolution of language teaching in a university context (1900–2019). *Texto Livre Ling. e Tecnol.* **2019**, *12*, 16–36. [CrossRef]
4. Collier, M.; Trauer, E.; Perassi, R.; Costa, E. Interdisciplinarity, design thinking, and innovation in public spaces: A teaching experience in florianopolis botanical garden park. *J. Innov. Sustain.* **2019**, *10*, 86–97. [CrossRef]
5. Androutsos, A.; Brinia, V. Developing and piloting a pedagogy for teaching innovation, collaboration, and co-creation in secondary education based on design thinking, digital transformation, and entrepreneurship. *Educ. Sci.* **2019**, *9*, 113. [CrossRef]
6. Aznar-Díaz, I.; Cáceres-Reche, M.P.; Trujillo-Torres, J.M.; Romero-Rodríguez, J.M. Mobile learning y tecnologías móviles emergentes en Educación Infantil: Percepciones de los maestros en formación. *Rev. Espac.* **2019**, *40*, 14–21.
7. Gómez-García, G.; Trujillo-Torres, J.M.; Aznar-Díaz, I.; Cáceres-Reche, M.P. Augment reality and virtual reality for the improvement of spatial competences in Physical Education. *J. Hum. Sport Exerc.* **2018**, *13*, 189–198. [CrossRef]
8. Hinojo-Lucena, F.J.; Aznar-Díaz, I.; Cáceres-Reche, P.; Romero-Rodríguez, J.M. Opinión de futuros equipos docentes de educación primaria sobre la implementación del mobile learning en el aula. *Rev. Electron. Educ.* **2019**, *23*, 283–299. [CrossRef]
9. López, D.; Calonge, A.; Rodríguez, T.; Ros, G.; Lebron, J.A. Using gamification in a teaching innovation project at the University of Alcala: A new approach to experimental science practices. *Electron. J. Learn.* **2019**, *17*, 93–106. [CrossRef]
10. López, J.; Fuentes, A.; López, J.A.; Pozo, S. Formative transcendence of flipped learning in mathematics students of secondary education. *Mathematics* **2019**, *7*, 1226. [CrossRef]
11. Salas-Rueda, R.A. Use of the TPACK model as an innovation tool for the teaching-learning process on mathematics. *Perspect. Educ.* **2018**, *57*, 3–26. [CrossRef]
12. Hofmann, R.; Mercer, N. Teacher interventions in small group work in secondary mathematics and science lessons. *Lang. Educ.* **2016**, *30*, 400–416. [CrossRef]
13. Zhang, S.; Wen, Y.; Liu, Q. Exploring student teachers? Social knowledge construction behaviors and collective agency in an online collaborative learning environment. *Interact. Learn. Environ.* **2019**, 1–13. [CrossRef]
14. Kerhani, P.; Kaveh, M.H.; Faghih, S.; Salehi, M. Improving diet quality among adolescents, using health belief model in a collaborative learning context: A randomized field trial study. *Health Educ. Res.* **2019**, *34*, 279–288. [CrossRef]
15. Acosta, R.; Martín-García, A.V.; Hernández, A. Use of the collaborative learning methodologies with ICT: An analysis based on the teachers' beliefs. *Digit. Educ. Rev.* **2019**, *35*, 309–323.
16. Maqtary, N.; Mohsen, A.; Bechkoum, K. Group formation techniques in computer-supported collaborative learning: A systematic literature review. *Technol. Knowl. Learn.* **2019**, *24*, 169–190. [CrossRef]
17. Van Leeuwen, A.; Janssen, J. A systematic review of teacher guidance during collaborative learning in primary and secondary education. *Educ. Res. Rev.* **2019**, *27*, 71–89. [CrossRef]
18. Isohatala, J.; Naykki, P.; Jarvela, S. Cognitive and socio-emotional interaction in collaborative learning: Exploring fluctuations in students' participation. *Scand. J. Educ. Res.* **2019**, 1–21. [CrossRef]
19. Alghasab, M.; Hardman, J.; Handley, Z. Teacher-Student interaction on wikis: Fostering collaborative learning and writing. *Learn. Cult. Soc. Interact.* **2019**, *21*, 10–20. [CrossRef]
20. Voupala, E.; Naykki, P.; Isohatala, J.; Jarvela, S. Knowledge co-construction activities and task-related monitoring in scripted collaborative learning. *Learn. Cult. Soc. Interact.* **2019**, *21*, 234–249. [CrossRef]
21. Jung, J.; Shin, Y.; Zumbach, J. The effects of pre-training types on cognitive load, collaborative knowledge construction and deep learning in a computer-supported collaborative learning environment. *Interact. Learn. Environ.* **2019**, 1–13. [CrossRef]

22. Boulton, H. Crossing boundaries: The affordances of new technologies in supporting a collaborative learning environment for doctoral students learning transnationally. *Technol. Pedag. Educ.* **2019**, *28*, 255–267. [CrossRef]
23. Hirsh, A.; Segolsson, M. Enabling teacher-driven school-development and collaborative learning: An activity theory-based study of leadership as an overarching practice. *Educ. Manag. Adm. Leadersh.* **2019**, *47*, 400–420. [CrossRef]
24. Schnaubert, L.; Bodemer, D. Providing different types of group awareness information to guide collaborative learning. *Int. J. Comput. Support. Collab. Learn.* **2019**, *14*, 7–51. [CrossRef]
25. Zhang, X.; Meng, Y.; Ordóñez, P.; Sun, Y. Learning analytics in collaborative learning supported by Slack: Fromthe perspective of engagement. *Comput. Hum. Behav.* **2019**, *92*, 625–633. [CrossRef]
26. Hautala, J.; Schmidt, S. Learning across distances: An international collaborative learning project between Berlin and Turku. *J. Geogr. High. Educ.* **2019**, *43*, 181–200. [CrossRef]
27. Gomez, L.F. Intention and pedagogical competence: Use of collaborative learning in the subject of mathematics in Secondary school. *Propósitos Represent.* **2016**, *4*, 157–179.
28. Hargreaves, E.; Elhawary, D.; Mahgoub, M. 'One girl had a different idea': Children's perspectives on learning and teaching models in the traditional classroom. *Int. J. Prim. Elem. Early Years Educ.* **2020**, *48*, 97–99. [CrossRef]
29. Simons, M.; Baeten, M.; Vanhees, C. Team teaching during field experiences in teacher education: Investigating student teachers' experiences with parallel and sequential teaching. *J. Teach. Educ.* **2020**, *71*, 24–40. [CrossRef]
30. Domingo-Coscollola, M.; Bosco, A.; Carrasco, S.; Sánchez, J.A. Fostering teacher's digital competence at university: The perception of students and teachers. *Rie Rev. Investig. Educ.* **2020**, *38*, 167–182. [CrossRef]
31. Tissenbaum, M. I see what you did there! Divergent collaboration and learner transitions from unproductive to productive states in open-ended inquiry. *Comput. Educ.* **2020**, *145*, 103739. [CrossRef]
32. Hsieh, Y.C. Learner interactions in face-to-face collaborative writing with the support of online resources. *ReCALL* **2020**, *32*, 85–105. [CrossRef]
33. Troussas, C.; Krouska, A.; Sgouropoulou, C. Collaboration and fuzzy-modeled personalization for mobile game based learning in higher education. *Comput. Educ.* **2020**, *144*, 103698. [CrossRef]
34. Chatterjee, R.; Correia, A.P. Online students' attitudes toward collaborative learning and sense of community. *Am. J. Distance Educ.* **2019**, *34*, 53–68. [CrossRef]
35. Asino, T.I.; Pulay, A. Student perceptions on the role of the classroom environment on computer supported collaborative learning. *Techtrends* **2019**, *63*, 179–187. [CrossRef]
36. Volet, S.; Seghezzi, C.; Ritchie, S. Positive emotions in student-led collaborative science activities: Relating types and sources of emotions to engagement in learning. *Stud. High. Educ.* **2019**, *44*, 1734–1746. [CrossRef]
37. Bers, M.U.; González-González, C.; Armas-Torres, U. Coding as a playground: Promoting positive learning experiences in childhood classrooms. *Comput. Educ.* **2019**, *138*, 130–145. [CrossRef]
38. Rojprasert, S.; Neanchaleay, J.; Boonlue, S.; Sinlarat, P. Designing and implementing constructionist learning in a blended advertising photography course. *Int. J. Technol. Enhanc. Learn.* **2020**, *12*, 20–37. [CrossRef]
39. Zhang, M. Towards a quantitative model of understanding the dynamics of collaboration in collaborative writing. *J. Second Lang. Writ.* **2019**, *45*, 16–30. [CrossRef]
40. Selcuk, H.; Jones, J.; Vonkova, H. The emergence and influence of group leaders in web-based collaborative writing: Self-reported accounts of EFL learners. *Comput. Assist. Lang. Learn.* **2019**, 1–21. [CrossRef]
41. Abrams, Z.I. Collaborative writing and text quality in Google Docs. *Lang. Learn. Technol.* **2019**, *23*, 22–42.
42. Ardiasih, L.S.; Emzir, A.; Rasyid, Y. Online Collaborative Writing Technique Using Wiki: How Effective is It to Enhance Learners' Essay Writing? *J. Asia TEFL* **2019**, *16*, 531–546. [CrossRef]
43. Chen, W. An Exploratory Study on the Role of L2 Collaborative Writing on Learners' Subsequent Individually Composed Texts. *Asia-Pac. Educ. Res.* **2019**, *28*, 563–573. [CrossRef]
44. Zioga, C.; Bikos, K. Collaborative writings using Google docs in primary education: Development of argumentative discourse. *Turk. Online J. Distance Educ.* **2020**, *21*, 133–142. [CrossRef]
45. Wang, L. Effects of regulation on interaction pattern in web-based collaborative writing activity. *Comput. Assist. Lang. Learn.* **2019**, 1–35. [CrossRef]
46. Krishnan, J.; Yim, S.; Wolter, A.; Cusimano, A. Supporting Online Synchronous Collaborative Writing in the Secondary Classroom. *J. Adolesc. Adult Lit.* **2019**, *63*, 135–145. [CrossRef]
47. Nykopp, M.; Marttunen, M.; Erkerns, G. Coordinating collaborative writing in an online environment. *J. Comput. High. Educ.* **2019**, *31*, 536–556. [CrossRef]

48. Gallego, M. L2 Spanish morphosyntactic development through collaborative writing: An analysis of mood production, text length and syntactic complexity. *Lang. Teach. Res.* **2019**. [CrossRef]
49. Wang, L. The impact of computer-mediated contexts on interaction pattern of ESL learners in collaborative writing. *Technol. Pedagog. Educ.* **2019**, *28*, 547–562. [CrossRef]
50. Chen, W.; Yu, S. Implementing collaborative writing in teacher-centered classroom contexts: Student beliefs and perceptions. *Lang. Aware.* **2019**, *28*, 247–267. [CrossRef]
51. Blau, I.; Shamir-Inbal, T.; Hadad, S. Digital collaborative learning in elementary and middle schools as a function of individualistic and collectivistic culture: The role of ICT coordinators' leadership experience, students' collaboration skills, and sustainability. *J. Comput. Assist. Learn.* **2020**, 1–16. [CrossRef]
52. Silva, M.F.; Malheiro, B.; Guedes, P.; Duarte, A.; Ferreira, P. Collaborative Learning with Sustainability-driven Projects: A Summary of the EPS@ISEP Programme. *Int. J. Eng. Pedagog.* **2018**, *8*, 106–130. [CrossRef]
53. Augustin, S. The Burnout Phenomenon: A Comparative Study of Student Attitudes Toward Collaborative Learning and Sustainability. *J. Inter. Des.* **2014**, *39*, 17–31. [CrossRef]
54. Schechter, C.; Ganon, S. Learning from success: Exploring the sustainability of a collaborative learning initiative. *J. Educ. Adm.* **2012**, *50*, 732–754. [CrossRef]
55. Kallstrom, H.N.; Ljung, M. Social sustainability and collaborative learning. *Ambio* **2005**, *34*, 376–382. [CrossRef] [PubMed]
56. Segura-Robles, A.; Moreno-Guerrero, A.J.; Parra-González, M.E.; López-Belmonte, J. Review of Research Trends in Learning and the Internet in Higher Education. *Soc. Sci.* **2020**, *9*, 101. [CrossRef]
57. Moreno-Guerrero, A.J.; Rodríguez-Jiménez, C.; Gómez-García, G.; Ramos, M. Educational Innovation in Higher Education: Use of Role Playing and Educational Video in Future Teachers' Training. *Sustainability* **2020**, *12*, 2558. [CrossRef]
58. Moreno-Guerrero, A.J.; Rondón, M.; Martínez, N.; Rodríguez-García, A.M. Collaborative Learning Based on Harry Potter for Learning Geometric Figures in the Subject of Mathematics. *Mathematics* **2020**, *8*, 369. [CrossRef]
59. Hernández, R.; Fernández, C.; Baptista, M.P. *Metodología de la Investigación*, 6th ed.; McGraw Hill: Madrid, Spain, 2014; pp. 129–168.
60. Chou, P.N.; Feng, S.T. Using a Tablet Computer Application to Advance High School Students' Laboratory Learning Experiences: A Focus on Electrical Engineering Education. *Sustainability* **2019**, *11*, 381. [CrossRef]
61. Yılmaz, A.; Soyer, F. Effect of Physical Education and Play Applications on School Social Behaviors of Mild-Level Intellectually Disabled Children. *Educ. Sci.* **2018**, *8*, 89. [CrossRef]
62. Zhang, H.; Song, W.; Shen, S.; Huang, R. The effects of blog-mediated peer feedback on learners' motivation, collaboration, and course satisfaction in a second language writing course. *Australas. J. Educ. Technol.* **2014**, *30*, 670–685. [CrossRef]
63. Strijbos, J.; Narciss. S.; Dünnebier, K. Peer feedback content and sender's competence level in academic writing revision tasks: Are they critical for feedback perceptions and efficiency? *Learn. Instr.* **2010**, *20*, 291–303. [CrossRef]
64. Nie, Y.; Lau, S. Differential relations of constructivist and didactic instruction to students' cognition, motivation, and achievement. *Learn. Instr.* **2010**, *20*, 411–423. [CrossRef]
65. Stump, G.S.; Hilperta, J.C.; Husman, J.; Chung, W.; Kim, W. Collaborative learning in engineering students: Gender and achievement. *J. Eng. Educ.* **2011**, *100*, 475–497. [CrossRef]
66. Lee, S.J.; Srinivasan, S.; Trail, T.; Lewis, D.; Lopez, S. Examining the relationship among student perception of support, course satisfaction, and learning outcomes in online learning. *Internet High. Educ.* **2011**, *14*, 158–163. [CrossRef]
67. Pozo, S.; López, J.; Moreno-Guerrero, A.J.; López, J.A. Impact of Educational Stage in the Application of Flipped Learning: A Contrasting Analysis with Traditional Teaching. *Sustainability* **2019**, *11*, 5968. [CrossRef]
68. Jöreskog, K.G. *Analysis of Ordinal Variables 2: Cross-Sectional Data*; Text of the Workshop "Structural Equation Modelling with LISREL 8.51"; Friedrich-Schiller-Universität Jena: Jena, Germany, 2001; pp. 116–119.