COOPERATIVE LEARNING VIA SEMIOTIC FEEDBACK IN ANCIENT GREEK TEACHING: A CASE STUDY IN GREEK AND ITALIAN SCHOOLS

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ABSTRACT
The teaching of Ancient Greek is alive in the Greek and Italian educational systems, though it follows traditional methods of teaching by focussing on grammar and translation, since the methodology of Classical languages has not been developed as much as that of modern languages. Using an intercultural approach, this study examines the short- and long-term performance of students who were engaged in correcting the work of others in a cooperative digital learning environment. The participants, who did not share a common language, worked together through the use of a semantic sign system, which enabled them to correct exercises and provide feedback to their peers by indicating the types of errors made. The independent variable (the experience in the learning of Ancient Greek) and the dependent variable (the outcome of test scores) were measured through the performance of students following a pre and post-"treatment" approach. The data collected revealed that the method of providing corrective feedback through semiotic signs had a positive impact upon the short- and long-term performance of students. The learning experience did not seem to affect statistically students' final short- and long-term results, though students with twelve months of experience scored higher on all the tests.

KEYWORDS
Collaborative language learning, corrective feedback, semiotic feedback, peer-learning, Ancient Greek teaching

1. INTRODUCTION

Language education has, for many years, followed a typical direction from the teacher to the learner and most of the class-time was dedicated to record or investigate interactions between the members of this pair. Comparatively less has been discussed or investigated of what was happening between the learners during class or after class hours and thus, this aspect of education was fairly neglected. Cooperative learning is occurring in all goal-oriented educational settings and specifies the ways students interact with each other to meet the set goals. Under this setup, students learn to compete with each other (not antagonistically), to work cooperatively or individually to meet the learning targets but also to learn how to cooperate. While cooperative learning was taking place unofficially for as many years as formal education was structured, it became an acknowledged, accepted and structured form of instruction to be integrated in formal teaching only recently and received an intense growing research interest since then.

In many reported cases, cooperative learning was investigated between learners of the same class, and it has proved to significantly improve the learning outcome and

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instructional productivity in those learning setups[1]. As it would be expected, the concept of cooperative language learning, also affected by developments in technology and cooperation via the Internet, started to gain ground. An example is the Hauck and Youngs' study[2] in which, the results of interaction between subjects having French as their mother tongue and subjects learning French as a target language, in a multimodal online learning environment, provided positive results for both groups due to the possibilities of audio-synchronous tools. Vonderwell's research[3] highlights students' positive opinions on collaborative learning, while Lee[4] underlined the relationship between students' language and digital skills and the quality of the interaction result. Further, Gielen et al.[5] and Shih[6] concluded that a student can take advantage of the application of peer assessment in collaborative language learning through a critical approach of the evaluated task. Finally, Drakos and Tzimogianni's study[7] examined the application of Google docs as an online collaborative tool in Modern Greek language teaching with positive results.

In all the above-mentioned cases, the action of cooperation was achieved through the medium of language and consequently, a common language had to exist between the learners. This fact practically limits the possibility of creating pairs for cooperation without a common channel of communication and thus the language barrier becomes a confining variable. Creating a conduit of communication, other than a standard language, has not been attempted or tested in the related bibliography. This study wishes to contribute to this aspect with a collaborative intercultural environment for classical languages to be examined, where communication was arranged through an invented basic semiotic language. It was tested whether this setup could be a factor influencing students' progress (dependent variable) concerning the learning of AG. In more detail:

- A telecollaboration channel was implemented aiming to engage students in meaningful interaction, promoting exchange of knowledge between members of each pair.
- Students', with different mother tongues, cooperation was attempted through a common made up semiotic sign-language, created for the experiment.
- Efficacy of corrective feedback through semiotic signs and impact to students' progress was tested through the performance of the participants in a final test.

[1] R. T. Johnson – D. W. Johnson, "Active learning: cooperation in the classroom", *The annual report of educational psychology in Japan* 47, 2008, 29-30; S. Yamarik, "Does cooperative learning improve student learning outcomes?", *The journal of economic education* 38, 2007, 259-277; J. M. Laguador, "Cooperative learning approach in an outcomes-based environment", *International Journal of Social Sciences, Arts and Humanities* 2, 2014, 46-55.

[2] M. Hauck – B. L. Youngs, "Telecollaboration in multimodal environments: The impact on task design and learner interaction", *Computer Assisted Language Learning* 21, 2008, 87-124.

[3] S. Vonderwell, "An examination of asynchronous communication experiences and perspectives of students in an online course: A case study", *The Internet and higher education* 6, 2003, 77-90.

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[6] R. C. Shih, "Can Web 2.0 technology assist college students in learning English writing? Integrating Facebook and peer assessment with blended learning", *Australasian Journal of Educational Technology* 27, 2011, 829-845.

[7] K. Drakou – A. Tzimogiannis, "Speech production using collaborative tools: A case study of teaching Modern Greek in the 3rd year of High School" (in Greek), Θέματα Επιστημών και Τεχνολογίας στην Εκπαίδευση 9, 2017, 63-85.

The only independent intervening variable examined was, *years of experience in learning AG* as it has been suggested to be a powerful factor increasing the efficiency of learning[8]. It was hypothesized that this course of action would increase students' involvement and final learning achievement in the subject of AG. The following alternative research hypotheses were tested:

H_1. Cooperative learning through semiotic feedback between peers of different nationalities via the internet can have a significant impact on the learning outcome of AG.
H_2 Gained knowledge remains in the long-term memory when tested after a week.
H_3. Learning experience of participants in the subject of AG influences the dependent variable tested (achievement of learning outcome).

The selected pairs were Italian and Greek learners in an authentic Lyceum environment. The dyad of the Italians and the Greeks was selected as the subject of AG is taught in an almost parallel fashion between the two countries. The two curricula, of the Greek Lyceums and the Liceo Classico in secondary education, offer AG and thus presented an optimum opportunity for this intercultural study and the hypotheses to be tested. In this light, the curricula were both stable variables and they were not tested in the study. In both cases the cognitive field is approached through the analysis of grammatical and syntactical phenomena while texts of AG literature are examined also interpretatively.

The paper unfolds by initially (very shortly) presenting and discussing the basic notions of cooperative learning, feedback and peer assessment, and further proceeds by describing the method and the presentation of the results. Finally, concluding remarks are presented in the last chapter.

2. COLLABORATIVE LEARNING AND FEEDBACK

2.1 COLLABORATIVE LEARNING

Alternative methods of approaching language courses are being under scientific research, as the importance and the effectiveness of students' collaboration during language teaching and learning has been highlighted[9]. A working definition provided by Roschelle and Teasley[10], understands collaboration as "a coordinated, synchronized activity, which is the result of a continuous effort to structure and maintain a common handling of a problem". This definition encompasses a common argument, which appears in other definitions, which distinguish collaboration as a task in which two or more people, as a group, aim at achieving a common learning goal[11]. However, collaboration among

[8] S. Loewen – R. Erlam, "Corrective feedback in the chatroom: An experimental study", *Computer Assisted Language Learning* 19, 2006, 1-14.
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students proved to be a complex procedure to investigate, as learners are trying to alternatively approach and manage a learning environment which is often traditionally structured according to its learning objectives.

During the last decades, research conclusions have been reached concerning the effectiveness of collaboration both in performance and in social behavior[12] maximizing learning outcome, personal willingness level and individual's belief about themselves, even building positive peer relations. In addition, collaboration seems to promote issues related not only to students' discipline within a classroom and their interdependence but also, matters related to the way in which gaining new knowledge is achieved[13]. These elements demonstrate that new knowledge can be gained in an alternative way, which is far from the traditional one-sided teaching.

Nevertheless, it is clarified that collaborative learning cannot be conceived as a mechanism or a method, nor even as a simple coexistence of individuals occupied in a joint assignment activity. Indeed, it is a mental process which can be successful only if teaching is systematic and reinforced within the classroom[14]. Dillenbourg explained that collaborative learning is the state through which cognitive skills and mechanisms are boosted so that students can reach knowledge in an effective way[15]. By that respect, collaboration is perceived as a kind of agreement and a definition of working conditions by the participants themselves. Therefore, it would be absurd to characterize it as a method[16], but rather as a way towards learning autonomy, if it is based on a good planning[17].

In a collaborative environment, trainees gain knowledge both from their results and also from their colleagues' interventions through a student-centered model, a Community of Practice (CoP), in its most advanced form. CoPs are based not only on the sharing of knowledge, the action followed by the collective management and the exploitation of the existing one, but also on the momentum driven by the continuous procedure of creating new action. In CoPs, the main difference from other types of collaborative models lies in the fact that, the members contribute to this community in the same way, as each member's existing knowledge and experience contributes to the issue being discussed. A CoP seems to be a suitable operational environment for intercultural communication through the computer. And its structure supports the passing to a new era where the teacher does not lead exclusively the learning community. In a CoP the coordinator of a discussion does not remain the same but changes according to the topic of discussion.

1994, 159-174; P. Dillenbourg, "What do you mean by collaborative learning?", in *P. Dillenbourg Collaborative learning: Cognitive and computational approaches. advances in learning and instruction series*, Oxford: Elsevier, 1999, 1-19.

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[14] R. T. Johnson - D. W. Johnson, "Cooperative learning in the science classroom", *Science and children* 24, 1986, 31-32.

[15] Dillenbourg, "What do you mean…", 5.

[16] Dillenbourg, "What do you mean…", 8-9.

[17] G. Kessler – D. Bikowski, "Developing collaborative autonomous learning abilities in computer mediated language learning: Attention to meaning among students in wiki space", *Computer Assisted Language Learning* 23, 2010, 41-58.

In this respect, it becomes clear that it is the topic that is of interest to the members, which further defines the coordinator, and not the leader who defines the topic[18].

2.2 CORRECTIVE, SUPPORTIVE FEEDBACK

Ypsilandis[19] separated the term feedback into a) corrective, and b) supportive. Corrective feedback was the known control mechanism which evaluates student response at a productive stage of learning, while supportive feedback was proposed as a mechanism assisting the process of learning with additional information, to the initial input, provided by external sources, i.e. teachers, other learners, the computer or traced by the learner him/herself.

In this study, corrective feedback was provided by a peer from the other country in the form of offering a semiotic sign identifying the type of error committed, without providing the correct answer. This type of correction was meant to act as a prompt and aimed to intensify student engagement in the learning process. In support of indirect feedback, Ferris[20], states that direct feedback leads to a sterile memorization of the error without the student being engaged in the learning process.

2.3 SEMIOTIC FEEDBACK

In the present study, the type of the made-up semiotic language selected to be used for the provision of feedback concerns the means of communication, the genre type or the lingo employed to perform the act of correction. This language is based on the functionality of nonverbal signs as initially presented by Ellis[21], which formulated and conveyed meanings ("backchannel cues"). Semiotic feedback may be seen to reflect a strategy through which feedback is provided among students that do not have a common language of communication. Special signs and symbols were set up in order to act as aids for peer corrective feedback to be provided in an intercultural environment. This way any pragmalinguistic failure was avoided.

[18] F. Nickols, "Communities of practice. A start-up kit", 1-8; P. Eckert, "Communities of practice", *Encyclopedia of language and linguistics* 2, 2006, 683-685; A. Tsopanoglou – G. Ypsilantis, "Conventional and alternative forms of language teacher training", *Multilingual Academic Journal of Education and Social Sciences* 1, 2013, 48-54.

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3. PEER ASSESSMENT

Peer assessment is an innovative corrective method of the learning practice, which gives value to the learners themselves, defining them as operators of the evaluation process[22]. Relevant research, presents the various findings concerning the attitudes and the views of the students who have been involved in the procedure in two ways: On the one hand, there are cases in which students as evaluators have positive attitudes towards their own involvement in learning, and further claim that they are benefiting by the advantages of the assessment process[23]. On the other hand, there are also findings which show that this corrective method does not have the desired impact, especially on the learner's psychology. More specifically, research has shown that students tend to feel a lot of pressure not only while grading the assignments submitted by others, but also while being assessed by their peers[24].

Despite possible problems which may be caused by the incorrect guidance of students to their colleagues, Smith et al.[25] pointed out that, students benefit from such a procedure of interaction even if they are not aware of how to guide or be guided by their colleagues. The same authors also claimed that students, through their dialogue and their general interaction, can achieve better results even if they do not possess the knowledge to the problem they have been given. Each student's influence on their colleagues with new data can contribute to a constructive approach in the cognitive field.

4. METHOD
4.1 SUBJECTS

A total of 70 students were involved in the study. Half of those were from the 1st High School of Thessaloniki (Greece), where they were systematically taught AG for four consecutive years. The other half were 35 students of the Liceo Classico Gentileschi of Naples (Italy) who were taught AG as part of their curriculum for a year or two years respectively.

4.2 DESIGN AND PROCEDURE

Subjects worked in pairs (1 from each country) within the Google Docs environment. Seven days before the experiment instructions were provided to the students about the procedure to be followed during the experiment and the communication tool was presented to them. In addition, a semiotic dictionary was given with interpretations translated into Greek and Italian. The semiotic messages used during the experiment were to

[22] E. Meletiadou, "The impact of training adolescent EFL learners on their perceptions of peer assessment of writing", *Research Papers in Language Teaching and Learning* 3, 2012, 240-251
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be composed and transmitted, non-verbally, to their peers but with a specific sign or a combination of signs. In this way, not only did participants receive individual messages, but also regulatory grammar was built. It can be said that this method, based on semiotics, concerns the construction of signifiers, the combination of which conventionally present regulatory rules of language function. Therefore, it would be possible to claim that meta-linguistic feedback was provided, a method that can give students a better understanding of the way in which the language, they were exposed to, functions[26]. The subjects' communication model, based on semiotics, allowed participants to continuously process the document and create a communicative result.

More specifically, two multiple choice language exercises were formed, each concerning one of the two phases of the research. The exercises were about the "First-" and the "Second-" declension nouns of AG grammar. The grammatical phenomena tested were previously taught in the classroom and the exercises were used to offer further practice. No further teacher intervention was allowed during the experiment to examine the result of student's collaboration. The procedure was executed in three basic steps:

a. Subjects answered individually the closed questions, provided with the Google Docs tool (doc-version 1) (10 min). Scores were registered.

b. In pairs, they compared their answers and provided corrective feedback to each other with the semiotic sign-language (on the same doc-version 2) (40 min).

c. Immediately after that, subjects were tested individually with the same test (short-term memory) (10 min).

d. A week later they were re-tested with a similar test on the same grammatical points (long-term memory) (10 min).

4.3 TOOLS

The following tools were used:

a) The semiotic-sign-language provided to the subjects with definitions in both Greek and Italian.
b) The tests to initiate cooperation between the subjects.
c) The final tests measuring short and long-term achievement of both groups (dependent variable).

5. ANALYSIS
5.1 FREQUENCIES OF THE INDEPENDENT VARIABLE

The crosstabulation table below shows the frequencies of the experience of all subjects in the learning of AG. It is apparent that Greek participants had longer experience than the Italians who were divided in two groups.

[26] Ypsilandis, "On feedback provision…", 8.

Table 1.

		Country of Origin		
		Italy	**Greece**	Total
Experience in Months	**12 Months**	11	0	11
		31.4%	0.0%	15.7%
	21 Months	24	0	24
		68.6%	0.0%	34.3%
	30 Months	0	35	35
		0.0%	100.0%	50.0%
Total		35	35	70
		100.0%	100.0%	100.0%

In particular, 11 Italian participants (31.4% of the entire sample) had been taught AG for 12 months, while 24 (68.6%) for 21 months. On the other hand, Greek subjects (35) registered an experience of 30 months (100%) in the same subject. It may be concluded that this sample, consisting of three distinct groups, was appropriate for the variable *learning experience* to be tested (below) for impact in the learning outcome.

5.2 TEST SCORES IN RELATION TO H_1

Table 2 below, presents the scores of all subjects to the three tests administered during the experiment. The first column offers the descriptive statistics of the test before treatment while the next two columns, the scores right after treatment and after a week.

Table 2.

		Initial Score	Score after treatment	Score in stage 2
N	Valid	70	70	70
	Missing	0	0	0
Mean		3.2714	4.7857	4.8429
Median		3.0000	5.0000	5.0000
Mode		2.00[a]	5.00	5.00
Std. Deviation		1.38230	1.33940	1.29252

a. Multiple modes exist. The smallest value is shown

It is apparent that all descriptive measurements (mean, median, mode) are increased after treatment. The mean for all groups, from 3.2 at the initial score raises up to 4.7 right after treatment and 4.8 after a week (the scale being from 0-7). Notice also that,

standard deviation remains very low, at 1.3, 1.3 and 1.2 respectively, which means that individual scores are homogeneous and concentrate in the middle of the bell curve and not towards the extremes; a finding that strengthens the significance of the mean. The median (which is a simple measurement of central tendency when the scores are placed from the smallest to the largest value – the value that splits the sample score in half) is also increased (3 at the initial score and 5 for the two scores after treatment). Finally, the mode (which is the most frequent score appearing on the data values) is also increased from 2 before treatment to 5 for both tests after treatment. The above descriptive values clearly show that test results are increased an hour after treatment and that this increase is maintained after a week.

5.2.1 RESULTS FROM PAIRED SAMPLES T TEST: COMPARISONS BETWEEN MEANS OF SCORES

In order to investigate whether the registered increase in scores described above is statistically significant, a paired samples T test was employed.

Table 3.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Initial Score - Score right after treatment	-1,51429	1,29372	,15463	-1,82276	-1,20581	-9,793	69	,000
Pair 2	Initial Score - Score a week after treatment	-1,57143	1,50912	,18037	-1,93126	-1,21159	-8,712	69	,000

The test confirms that the difference is statistically significant at the p=<0.001 level of significance between the initial score and the score right after treatment (pair 1), and between the initial score and the score after a week (pair 2) with 69 degrees of freedom, which shows that the gained knowledge is maintained after a week. Correlations describe a moderately positive relationship at ,549 (Pair 1) and ,365 (Pair 2) respectively.

5.3 FURTHER STATISTICS: CORRELATIONS BETWEEN THE INDEPENDENT AND THE DEPENDENT VARIABLES

Further correlations between the independent variable (experience in the learning of AG) and the dependent variable (outcome of test scores) were investigated. A One-Way Anova Test that was implemented with the experience in the learning of AG as a factor in the analysis of the dependent variable (the scores). The results showed no statistically significant correlations between the variables. The test was performed in twos, three times: a) Learning Experience and Initial Test Scores, b) Learning Experience and Scores right After Treatment, and c) Learning Experience and Scores after a week. Interestingly, the group with the least experience scored higher than the other two at the initial test.

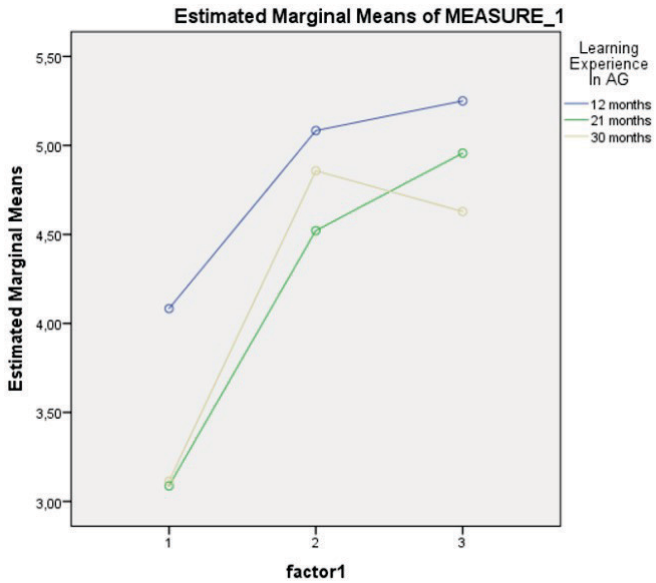
5.4 MEANS OF SCORES IN RELATION TO LEARNING EXPERIENCE

Table 4 below, offers the descriptive statistics for each group of the independent variable Learning Experience. More specifically, information is provided on the mean of the three scores of each group related to student performance. The difference among initial, right after treatment and after a week scores are presented in the 5th and the 6th row.

Table 4.

	12 months	**21 months**	**30 months**
Mean: Initial Score	4,18	3,08	3,11
Mean: Score after treatment	5,09	4,54	4,85
Mean: Score after a week	5,18	5	4,62
Difference between initial score and score after treatment	0,91	1,46	1,51
Difference between score after treatment and score after a week	0,03	0,31	-0,38

The highest score (4,18) achieved at the initial test was registered by the group with the least learning experience in AG (12 months), with the students having 30 months experience following (3,11), and the students having 21 months being very close to the second group (3,08), with a slight difference between them. However, at the test right after treatment, it is the two more experienced groups that seem to have benefited the most (1,46 and 1,51 respectively) despite that the group with the least experience still scored higher than them. Finally, the score after a week for all groups shows that gained knowledge is maintained in the long-term memory even though a small drop (-0,38) is registered in the group with the highest experience. The line chart (1) below, depicts the change in every group schematically.



Despite that the difference between groups is not statistically significant, it appears that the group with the lowest experience scored higher right from the beginning

of the experiment and maintained the gained difference at the two stages after treatment. Interestingly, no particular group seems to have benefited the most from this treatment as all groups score very close to each other at both tests after treatment. This confirms that: a) this cooperative method of working increased learning measurable outcome, and b) increase in all groups is similar and statistically significant from the initial test, irrespective of their learning experience. Despite this valuable finding, it is not possible to identify the reasons for this result.

6. DISCUSSION

Measurable learning achievement of cooperative corrective feedback through semiotic sign made-up language was tested through the performance of the participants in two tests after treatment, in authentic school environment conditions. In support of the first hypothesis, this type of cooperative procedure proved to (statistically) significantly increase the performance of all the participants, despite their differences in AG learning experience. Also, the gained knowledge was maintained, after a week, as it was revealed in the tests that followed, which supports the second hypothesis.

Within groups differences were statistically insignificant although the group that performed better among the three participating groups is the one with the least experience. This finding and the fact that the other two groups scored very close to each other, despite their different experiences in the learning of AG, clearly demonstrates that experience in the subject of AG in this sample, did not act as a predictor or a regulatory variable neither in the achievement score nor at the final result (supporting a null hypothesis in H_3). Notice also, that it is the two groups with most experience that have benefited the most and recorded the highest in between test increase (no hypothesis was stated for this finding).

Among the shortcomings of this research are: a) the limited number of participants, b) the one set-up testing scenario (Italians and Greeks) with small external validity, c) the scenario, which did not involve a control group taught in the traditional teaching method (to measure any possible differences between the two), and d) the positive results being a consequence of a novelty aspect, i.e. an initial experiment participation enthusiasm which may fade with time.

In this light, this study could be perceived as a good pilot for future research to extend this experiment to other cultures and other set-ups, where there is not a common language among the subjects and with comparisons of a control group taught in the traditional method and for a longer period of time.

7. CONCLUSIONS

The alternative, AG teaching approach, tested in this work exhibited very encouraging results despite the limitations described above. Although collaboration within the framework of foreign language learning had shown remarkable results in the past, this study attempted to implement the concept in a different set-up: a) the international cooperation took place without a common language, b) the topic and teaching targets were related to a classical language and not a target language which was the means of communication between the subjects while being the subject of study, c) the tool of communication was a purposefully made-up language created specifically for this experiment,

which limited cases of pragmalinguistic failure among the participants, and d) the environment was an authentic in both countries. The cooperative learning tool can be used in cases where there is not a common language among learners. The term semiology that was introduced, reflects this type of communication as well as the way of boosting all learning skills acquired and it is suggested as a term because of its etymologic dimension. Results were generally positive and corrective feedback by peers proved to be a excellent strategic tool in cases of a non-common language despite the limited communication. Other strategic choices or techniques can be also tested with a larger sample more representative of the student population.

Finally, this tested approach may lead to the use of alternative novel methods concerning the teaching of AG and other classical languages (Latin) and further increase cooperation of the small community of learners who are interested in these subjects. In this respect, this experiment may open paths of international digital cooperation and the creation of a made-up language to act as a tool for this purpose.

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