ESL Students' Perceptions of Error Correction Techniques in Oral Production: A Level-Based Approach

Maryna Zembytska
https://orcid.org/0000-0002-6671-9937
zembytskama@khmnu.edu.ua
Khmelnytskyi National University, Ukraine

Yulia Romanova
https://orcid.org/0000-0003-2840-3170
romanovayul@khmnu.edu.ua
Khmelnytskyi National University, Ukraine

Nataliia Chumak
https://orcid.org/0000-0001-5855-1268
im.chna@clouds.iir.edu.ua
Taras Shevchenko National University of Kyiv, Ukraine

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Abstract. The article reveals the findings from a survey examining students' perceptions of corrective feedback involving six groups of the first- through fifth-year ESL students enrolled in Bachelor's and Master's programs in English Language and Literature, Applied Linguistics, International Law, and International Communication and Global Media. The study attempts to reveal students' perceptions of corrective feedback, as well as its perceived effectiveness and psychological relevance, which are analyzed on the basis of students' answers. The aim of this survey-based research was to explore ESL students' preferences for the amount and type of corrective feedback in speaking/reading and develop a method to help educators effectively choose the types of corrective feedback on the basis of their students' level of English. In order to reinforce the study with substantial theoretical evidence, each type of corrective feedback was characterized on the basis of a rigorous review of related evidence-focused literature. The survey, which was administered to 78 ESL students at Taras Shevchenko National University of Kyiv and Khmelnytskyi National University, Ukraine, demonstrated a number of discrepancies in students' preferences and attitudes. Their responses constituted grounds for assessing and ranking the prevalent verbal correction techniques in ESL teaching according to their perceived relevance. The implications of the current study could be taken into consideration by ESL teachers for determining an optimal set of error correction techniques in their own classrooms on the basis of their students' level of English.

Keywords: *ESL students, perceptions, error correction, corrective feedback, error treatment, oral production, level-based approach, learner uptake, the Bayes' formula/theorem.*

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Зембицька Марина, Романова Юлія, Чумак Наталія. Сприйняття методів виправлення помилок в усному мовленні студентами, які вивчають англійську мову як другу іноземну: підхід на основі рівня володіння мовою.

Анотація. У статті викладено результати дослідження, проведеного на основі опитування студентів у шістьох групах з першого по п'ятий курси, які вивчають англійську мову як другу іноземну в рамках освітнього кваліфікаційного рівня "Бакалавр" та "Магістр" за спеціальностями "Англійська мова та література", "Прикладна лінгвістика", "Міжнародне право" та "Міжнародні комунікації". У дослідженні зроблено спробу з'ясувати особливості сприйняття студентами коригувального зворотного зв'язку за допомогою аналізу його передбачуваної ефективності та психологічної комфортності на основі індивідуальних відповідей студентів. Метою дослідження було на основі опитування з'ясувати, який тип та обсяг коригувального зворотного зв'язку під час говоріння/читання є бажаним з погляду студентів, які вивчають англійську мову як іноземну, та розробити метод, який допоможе вчителям ефективно обирати типи коригувального зворотного зв'язку на основі рівня володіння англійської мовою їхніми студентами. Кожен тип коригувального зворотного зв'язку був теоретично обґрунтований на основі вивчення наукової літератури, що спирається на відповідні емпіричні дослідження. Опитування, проведене у двох університетах України (Київському національному університеті імені Тараса Шевченка і Хмельницькому національному університеті) серед 78 студентів, які вивчають англійську мову як першу іноземну, продемонструвало низку розбіжностей в уподобаннях та ставленні студентів до різних методів виправлення помилок.

Ключові слова: *студенти, які вивчають англійську мову як іноземну; сприйняття, виправлення помилок, коригувальний зворотній зв'язок, виправлення помилок, усне мовлення, підхід на основі рівня володіння мовою, засвоєння, теорема/формула Баєса.*

Introduction

In the course of learning a second/foreign language, students regularly produce oral and written utterances which do not conform to the standards of the language being acquired, i.e. erroneous or ill-formed utterances (Corder, 2008). The traditional perception of errors as a sign of learners' incompetence has given way to viewing errors as a marker of the difficulties that learners are having with particular aspects of the language, which could be explained by the persistence of the habits imposed by their mother tongue. Numerous studies, taking the stance that corrective feedback constitutes an integral part of L2 instruction, testify to the acute need of providing more coherence between theory, research and pedagogy with respect to this domain. Since error making is a natural and inevitable part of SLA process, error treatment could reasonably be considered a significant component of L2 teaching which directly affects improvement. Hence, the question arises, which strategies should be chosen to facilitate better student learning on the one hand, and to avoid discouraging, demotivating or simply ineffective instruction on the other hand.

There is a vast body of research on students' perceptions regarding error treatment in foreign language teaching (Chen, 2005; Lasagabaster & Sierra, 2005; Lyster et al., 2013; Perdomo, 2018; Quinn, 2014; Sheen, 2010), greater attention being paid to corrective feedback in L2 written activities (Bitchener, 2008; Ferris & Roberts, 2001; Lee, 2004; Rezaei et al., 2017). Numerous studies have examined

error correction strategies implemented in teaching ESL students worldwide. However, a substantially smaller number of studies have focused on Eastern European ESL learners' attitudes and preferences in this domain, with Ukraine kept away from the spotlight. Therefore, this research was carried out to reveal Ukrainian students' perceptions and attitudes towards the oral correction techniques currently used in ESL teaching. Although researchers and ESL educators generally maintain that discovering and matching the expectations of teachers and students is beneficial for language learning, they have not demonstrated consistent approaches to error correction, disagreeing about the extent to which errors should be corrected, the types of errors that need correction, and the techniques to be used.

Therefore, the present research aims to explore ESL students' attitude towards the corrective feedback received while speaking/reading and identify the correlation between the students' L2 proficiency level and their preferences for corrective feedback, which could help educators develop the most effective error correction model for their ESL classroom corresponding to the students' expectations for the type and the amount of the corrective feedback provided.

The research questions posed are as follows:

1. What are the most effective oral correction techniques according to ESL students' perceptions?

2. What types of corrective feedback are more psychologically relevant than others?

3. How do students' preferences correlate with their level of English?

There are different views on the nature of linguistic errors, such as Lennon's error analysis (Lennon, 2008), which has indicated that certain errors recurring among language learners result from the intrinsic difficulty of the subsystem involved, rather than due to the cross-lingual influence. The author maintains that 'No matter what your first language is, whether it has prepositions or not, you will almost certainly find it very difficult to make no mistakes in English prepositions' (Lennon, 2008). As explained by the researcher, even if the ESL learner's first language has the category of verbal aspect, the choice between simple and progressive verb forms in English are likely to be erroneous. These 'developmental errors' are usually made regardless of their first language background and can hardly be predicted by contrastive analysis (Lennon, 2008). The assumption that error correction constitutes an essential aspect of language teaching also resonates in studies of Bartram and Walton (1991), Purwati (2012), Touchie (1986), and others.

To have a clear understanding of what types of errors are speculated on, it is important to differentiate between true errors of competence, revealing the extent of the learner's proficiency in the second language, and mistakes – errors of performance, having a circumstantial origin similar to slips of the tongue in the native language (Corder, 1967). Mistakes are made by both native speakers and foreign language learners, and can be self-corrected when pointed to the speaker. Errors in SLA are traditionally treated as a deviation from the rule, primarily due to the lack of knowledge. As defined by Lennon (1991), an error is 'a linguistic form or

combination of forms which in the same context and under similar conditions of production would, in all likelihood, not be produced by native speakers' counterparts' (Lennon, 1991, p. 182).

Method

The study involved six groups of EFL students in their first, second, third, fourth and fifth year of studies earning their Bachelor's and Master's degrees at Taras Shevchenko National University of Kyiv (Ukraine) and Khmelnytskyi National University (Ukraine) majoring in English Language and Literature, Applied Linguistics, International Law, International Communication and Global Media. The data were collected through the use of an online survey (Zembytska et al., 2019a; 2019b), classroom observations, and follow-up interviews with students. To eliminate a possibility of misinterpretation in students' responses, the terms 'error' and 'mistake' were clarified. Also, the questions selected for the survey were pilot-tested with a small group of similar candidates to avoid ambiguity. All the participants (78 students) were instructed to ensure their understanding of the terminology used for different types of corrective feedback.

Classroom observations were made during the lessons of English in order to supply students with some evidence for further reflection during the follow-up interviews regarding the efficacy of the corrective feedback provided by the teacher. The students used printed observation checklists to make necessary records. Before each lesson, students received printed observation forms with a list of correction techniques and blank spaces in front of them, which were supposed to be filled in with erroneous utterances, corrected by the teacher. Students were supposed to keep a record of their mistakes and indicate which of the suggested techniques was used in each case. In post-lesson interviews, students were encouraged to reflect on the mistakes they had made during the lesson.

Fourteen teachers, involved in the study, were asked to keep a record of students' errors and correct them using a range of error correction techniques. The teachers used printed charts with six error correction techniques (clarification, explicit correction, elicitation, metalinguistic clues, repetition, and recast) to mark those used during each lesson. The final teacher interview involved open-ended questions designed to stimulate their reflection on the techniques utilized.

At the final stage of the study, an online student survey (Zembytska et al., 2019a; 2019b) on SurveyMonkey online platform was held. The survey, administered anonymously to reduce the potential for any uncomfortable feelings among the participants, involved multiple choice response items and closed-ended questions. The fourteen questions raised in the survey generally fall into two groups: *methodological* aspects of corrective feedback in L2 instruction from the learners' perspective and *psychological* aspects of error correction, i.e. students' perception of the techniques commonly used by their teachers. The questions of the first group (e.g. *"Which error correction techniques are commonly used by your teachers?" "Please,*

rate the effectiveness of each error correction technique." "In your opinion, what type of errors should necessarily be corrected?") were aimed at finding out which error correction techniques students are familiar with, while the questions of the second group (e.g. *"What's your attitude towards error correction? Should all errors be corrected?" "Do you think error correction by the teacher in front of the whole group could be awkward/uncomfortable for you or your groupmates?" "Do you feel discouraged when the teacher interrupts your speech in order to correct your errors / mistakes?" "Which type of error correction is more appropriate for you?")* were raised to assess how appropriate these techniques are from the students' point of view. The question concerning the respondents' level of English *("What is your level of English?")* was included in the survey to see which error correction technique(s) tend to be preferred by learners at a particular stage of second-language acquisition. Before responding to the questions of the survey, the students had been asked to assess their L2 level on the basis of: a) self-assessment; b) B1 and B2 Cambridge English certificates they had received; and c) Cambridge English online test and Oxford English level tests. In order to reinforce their self-assessment, students were offered a CEFR global scale created by the Council of Europe.

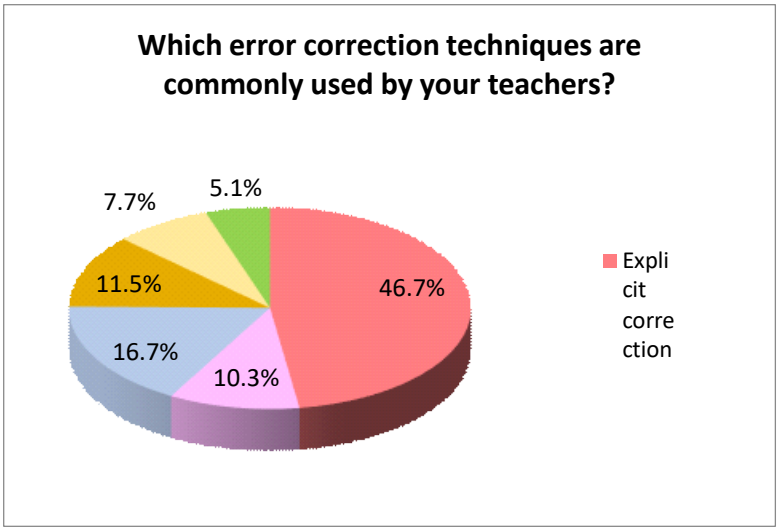
The respondents were asked to complete the online questionnaire individually at home, to avoid the effect of cross-fertilization which might occur during collective administering. A summary of individual responses, which were automatically collected and analyzed by the built-in tool of the mentioned survey platform, is presented in Figures 1-7. This analysis revealed the general attitude of the respondents towards error correction.

Next the results of the survery were sorted and distributed in interim tables according to the learners' L2 proficiency level. Since one of the research goals was to calculate the statistical likelihood that students belongoing to a particular L2 acquisition level (B1/B2/C1) should prefer a particular type of corrective feedback, the methods of applied statistics and the theory of probaility were used.

Results and Discussion

When asked to reflect on each type of corrective feedback during the follow-up interviews, students typically characterized *explicit correction* as a method 'easier for comprehension', 'conventional and therefore understandable', and 'faster'. While other students sustained the benefits of *repetition* because it was 'more likely to prevent errors in the future', 'quite understandable', 'easy to remember', much fewer students preferred *clarification* and *recast* as techniques which 'stimulated thinking', 'worked on a larger scale' (contributed to a deeper revision of rules, patterns etc.) were 'challenging in a good way' and 'helpful for memorizing the errors'.

Figure 1
Students' responses to the question addressing the range of error correction techniques used by their teachers



While analyzing students' responses in the online survey (Zembytska et al., 2019a) (Fig. 1), we found that the prevailing error correction technique used by their teachers was *explicit correction*. This type of response was given by the majority of students (46.7 %). This result supports the findings from a qualitative study by Tsang (2004), which demonstrated that teachers mostly used explicit correction and recast in ESL error correction. However, according to Tsang (2004), these techniques did not guarantee student-generated repair, while repetition was the most frequent type of feedback resulting in student repairs. Still, their study suggests that explicit correction and recast appeared to be helpful in treating phonological errors. Surprisingly different are findings from a study by Lee (2013), in which the most frequent type of corrective feedback was recast, which generated 92.09% learner repair. Other studies (Bitchener & Knoch, 2010; Chandler, 2003; Lee, 2005) suggest that explicit correction is preferable in writing, since its precision minimizes students' confusion over the corrective feedback received.

The second most common type of corrective feedback that students attributed to teachers within the current study was *recast* (16.7 % of the students). However, the study by Lyster and Ranta (1997) proved that 'recast, the most popular feedback technique, is the least likely to lead to uptake of any kind' (Lyster & Ranta, 1997: 54). Similarly, in Housen and Pierrard (2005), no student-generated repairs were observed using explicit correction and recasts since both techniques provide learners with correct forms. A study by Mackey et al. (2000) demonstrates that recasts were more preferable in treating morphosyntactic errors, while correction of pronunciation errors implied a more extensive use of clarification requests. In addition, Lyster (2001) has found recasts to be clearly beneficial for error treatment in the case of phonological errors. At the same time, Havranek and Cesnik (2001) emphasize the importance of reinforcing recasts with further comments or repetition by the corrected learner, with 'unfortified' recast being viewed as 'the least successful format of corrective feedback' (Havranek & Cesnik, 2001, p. 99). Analyzing this technique, Perdomo (2018) refers to it as one of the most

common types of negative feedback in native- and nonnative speakers' interaction in different settings; however, the same study admits that there is no sound evidence to properly claim that it is also the most effective corrective feedback for all teaching situations and language learners.

Clarification request ranked third among the most extensively used techniques in ESL classroom within our study, as specified by 10.3% of students. This technique, which involves asking a comprehension question to make students repeat what they said, is believed to help them reconsider and change the form of the utterance produced, especially if the students are given the awareness that comprehension check is used for confirmation of form, rather than meaning (Nicholas et al., 2001). Lyster (2005) has found negotiation of form, which includes elicitation, metalinguistic clues, clarification request, and repetition, to be more effective at leading to immediate repair than recasts or explicit correction, particularly in the case of lexical errors, as well as grammar errors and unsolicited uses of L1.

Repetition, which is recognized as an effective type of corrective feedback, along with metalinguistic feedback, elicitation and clarification requests (Heift, 2004), was reported to be the fourth extensively used error correction strategy by teachers in the current study, as reported by 11.5% of the respondents. This is at variance with a study by Havranek & Cesnik (2001), in which repetition was found the most frequent type of error treatment during language practice, in which the correct form was provided by the teacher and repeated by the learner.

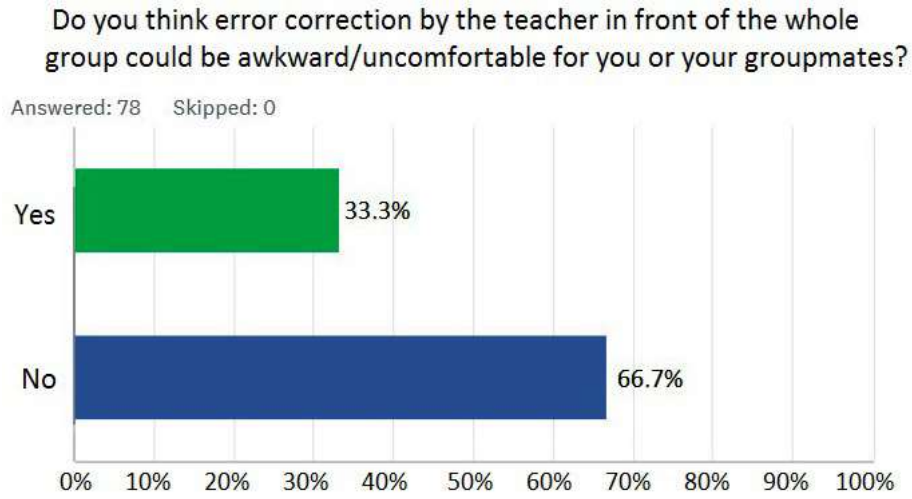
A mere 7.7% of the respondents recognized *metalinguistic feedback* as a strategy commonly used by their teachers. However, according to Lyster & Ranta (1997), metalinguistic feedback, clarification request and repetition are similarly effective at eliciting student uptake, although metalinguistic feedback is more likely to elicit student-generated repair than clarification request or repetition.

Elicitation, specified by 5.1% of the respondents, was the most uncommon technique in students' responses. By contrast, it was proved to be the most successful technique for eliciting uptake by Lyster & Ranta (1997). Similarly, in Housen & Pierrard (2005) metalinguistic feedback and elicitation were leading to learner uptake 98% of the time. This result is consistent with Lyster & Ranta's study (1997) in which 100% of learner utterances following elicitation involved learner uptake.

Before classroom observations, teachers participating in the study were encouraged to diversify their corrective feedback by using a wide range of error correction techniques. The results of classroom observations carried out within this study support those obtained by Lee (2013), where *recasts* appeared to be the most frequent type of corrective feedback used by ESL teachers. While observed, teachers in this study tended to react to students' erroneous utterances through *recasts* and *explicit correction*.

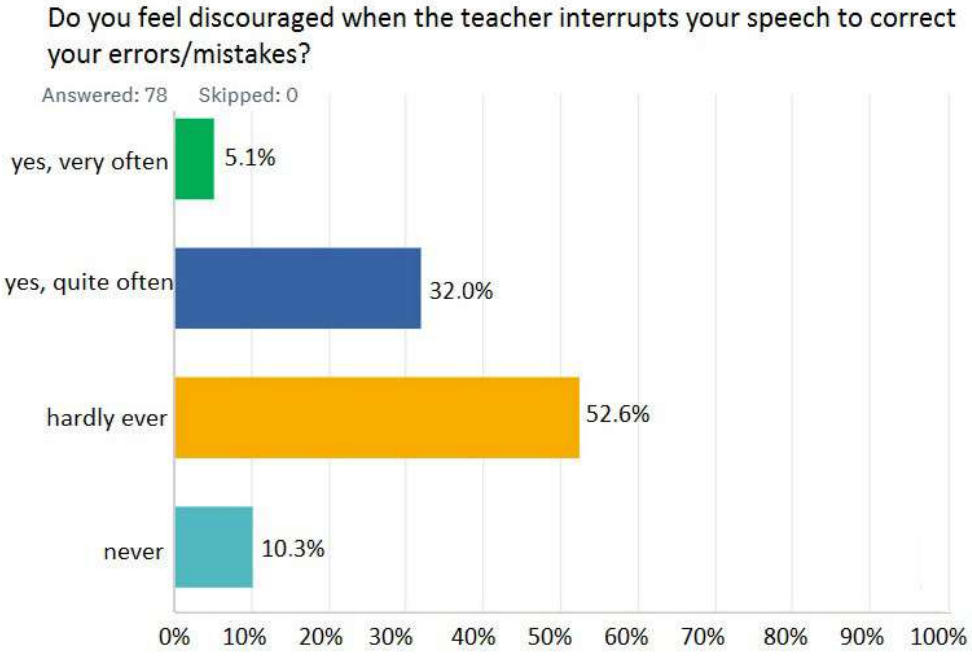
The online student survey revealed an alarming fact that as much as one third of the respondents admitted that error correction by the teacher in the classroom could be psychologically uncomfortable for them or other students (Fig. 2). This finding could serve a stimulus for ESL teachers to reflect on the types of positive corrective feedback that would reduce the levels of students' anxiety and therefore contribute to oral production fluency.

Figure 2
Students' perceptions of oral corrective feedback in terms of the psychological discomfort it may cause



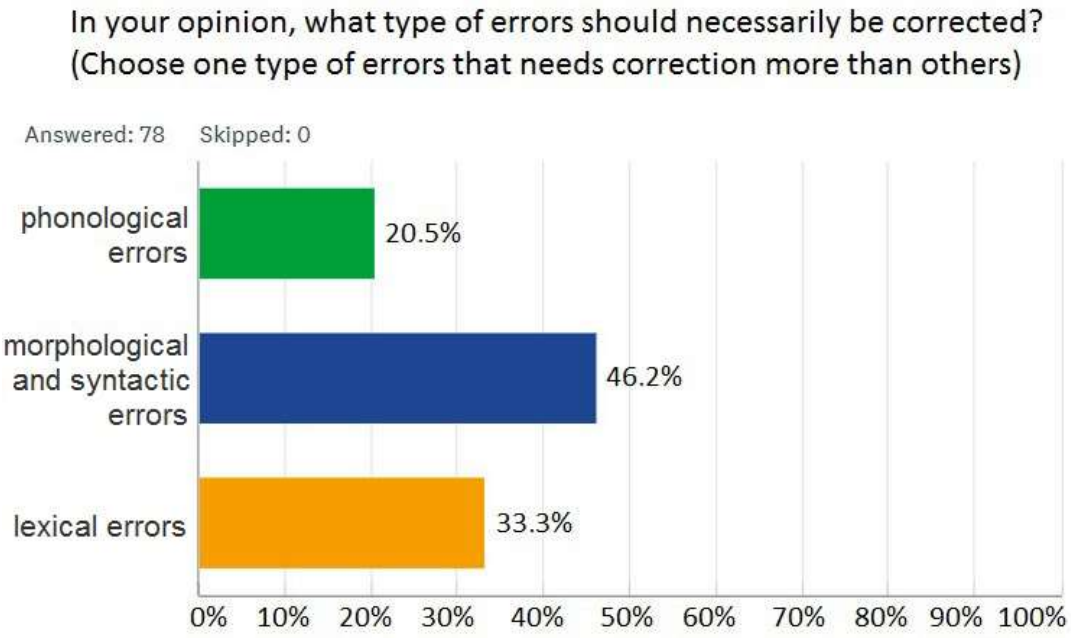
Furthermore, to support the previous statement, another question regarding the psychological relevance of error treatment was posed, in which the respondents reported that they were quite often (32 %) or very often (5%) discouraged by the teacher interrupting their oral production to correct the errors (Fig. 3).

Figure 3
Students' assessment of the frequency of discouragement associated with intrusive corrective feedback



In order to identify the types of errors that are recognized by university-level ESL learners as necessary for treatment, students were offered to choose one type of errors that needs corrective feedback more than others (Fig. 4). The majority of respondents (46.2%) gave priority to morphological and syntactic errors; one third of the students (33.3%) treated lexical errors as more urgent for corrective feedback; while nearly one fifth of the responding students (20.5%) believed that teachers should primarily react to their phonological errors (Fig.4). In a similar study by Zhang et al. (2010) ESL students regarded lexical errors as the most critical and deserving the greatest teacher's attention; while grammatical errors ranked the second and phonological errors – the last (Zhang et al., 2010, p. 307).

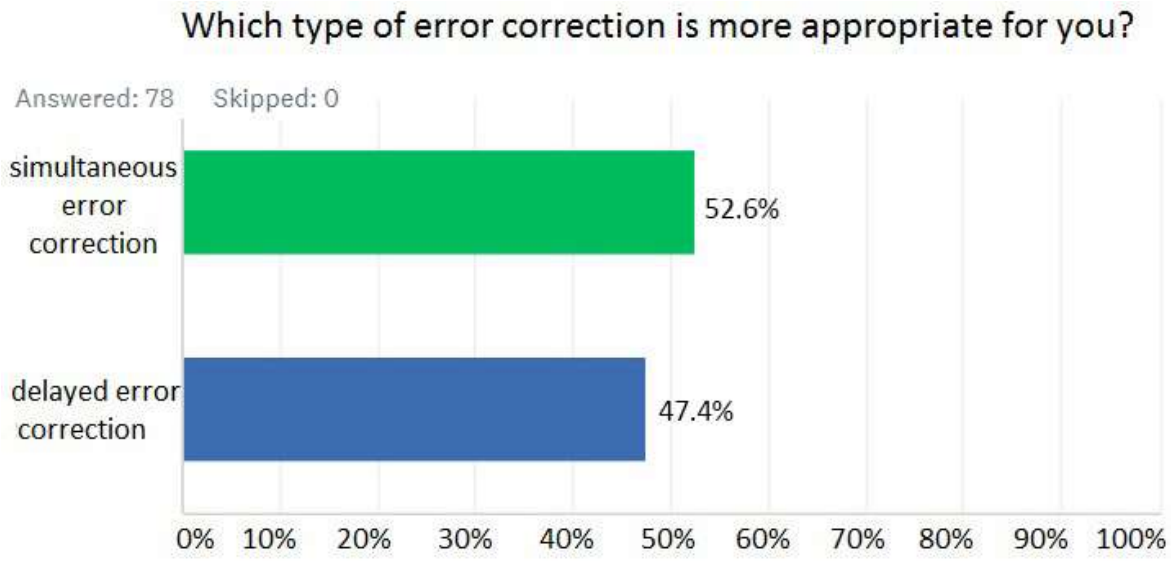
Figure 4
Students' vision of the type of errors in SLA which should necessarily be corrected



A controversial issue is whether corrective feedback should be provided simultaneously with the learner's oral production or after a while – as soon as a learner has finished speaking, after a particular activity is completed, or at the end of the lesson. Simultaneous feedback on the accuracy of ESL learners' oral production is associated with high rates of success and reduced likelihood of practicing errors (Archer & Hughes, 2011). However, analyzing its relevance, Park (2010) maintains that even though delay between an error and its treatment may undermine the effectiveness of corrective feedback, 'immediate error treatment can interrupt the flow of communication and even make students feel embarrassed or afraid of making errors' (Park, 2010: 61). To highlight the point, Park (2010) provides the evidence that 60% of the students in the high anxiety group preferred their errors to be treated after the activities are completed (Park, 2010, p. 49), as opposed to the students in the low anxiety group, who generally did not favour delayed error correction.

There was no major divergence in students' attitudes to simultaneous and delayed corrective feedback within the current study. The difference in response distribution constituted 5.2% in favour of simultaneous error correction (Fig. 5).

Figure 5
Preferences of the respondents towards the desired speed of corrective feedback received



We strongly agree with Touchie (1986) that frequent correction of oral errors may disrupt the process of language learning and discourage shy students from communicating in the target language. According to Touchie (1986), teachers should correct errors global errors which affect the general comprehension of utterances, putting more emphasis on high frequency and generality errors and errors produced by a large percentage of their students. As explained by Radecki & Swales (1988), students' need for error correction does not necessarily imply the usefulness of such feedback. A similar idea is expressed by Hedge (2000), who maintains that teachers should reduce their intrusion by responding to errors, which are systematic and result from the lack of knowledge, rather than mistakes, which are non-systematic and accidental. Teachers in a study by Lee (2013) strongly disagreed that they should correct all of the students' errors and mistakes, although they recognized the benefits of teachers' corrective feedback and the efficacy of immediate correction of the students' errors to enhance their oral proficiency.

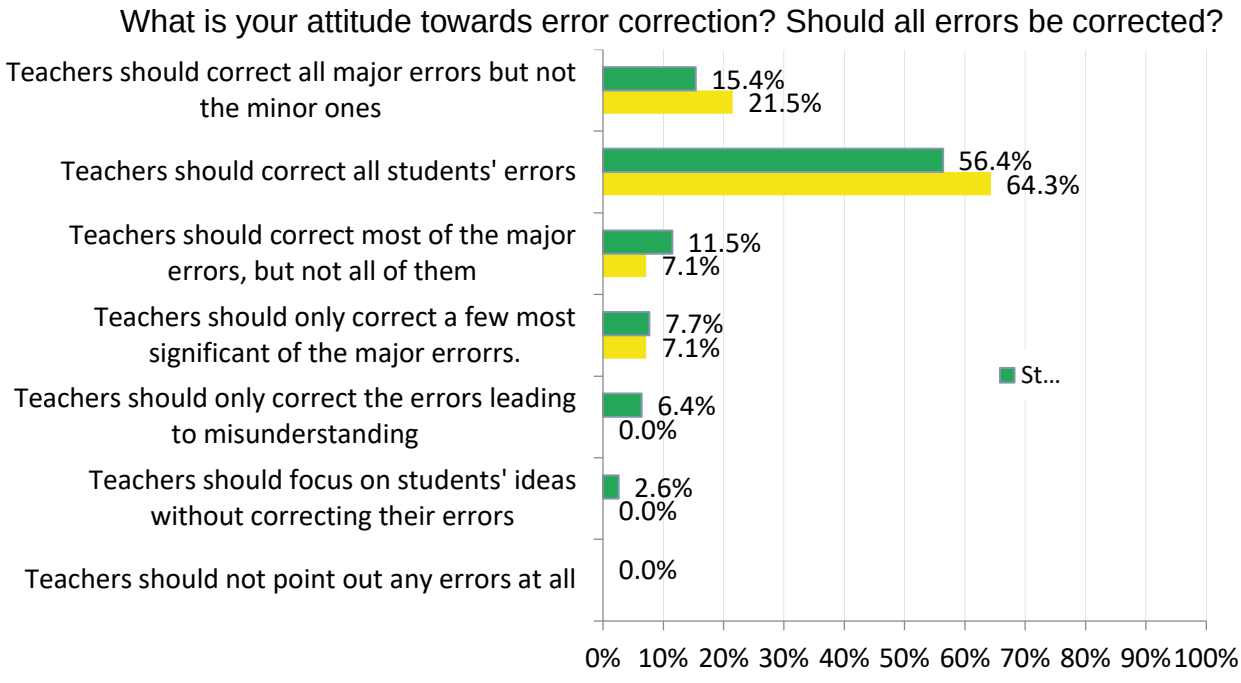
In teacher interviews held within the current study, 5 out of 14 instructors disapproved of the idea of correcting all errors, referring to the impediment it creates to the natural flow of communication in ESL classroom. However, both teachers and students completely opposed to the idea that teachers should not correct any errors at all. The majority of students admitted that corrective feedback raises their awareness of the existing problems and prevents them from making repetitive errors. Moreover, 56.4% of

students strongly supported the idea of receiving regular corrective feedback, suggesting that teachers should correct all students' errors.

Since positive reinforcement during language acquisition has been associated with increases in correct responding (Miltenberger, 2003; Worsdell et al., 2005), ESL teachers are generally in favour of correcting students' errors. The results of a similar study (Park, 2010) revealed that although teachers and students had significantly different opinions about types of errors that need correction, as well as the timing, method, and delivering agents of corrective feedback, students wished to get more corrective feedback than their teachers expected. In our survey, both teachers and students agreed on the necessity of error correction (Fig. 6). The majority of teachers expressed a belief that either 'all students' errors should be corrected' (64.3% of the teachers), or 'all major errors but not the minor ones' (21.5%). The students generally reacted to this question in a similar way, 56.4% of them supporting treatment of 'all students' errors' and 15.4% of the respondents expecting a corrective feedback on 'all major errors'. However, there is a clear distinction in terms of students' and teachers' attitude towards reducing corrective feedback to treating global errors leading to misunderstanding, hindering communication, and interfering with clarity of expression. While 9% of students in our survey were in favour of limited corrective feedback (6.4% of students supporting the idea of correction focused on errors leading to misunderstanding and 2.6% of students discarding any error correction as long as the expressed ideas are clear), teachers completely disregarded these options in the survey (0%) (Fig.6).

Figure 6

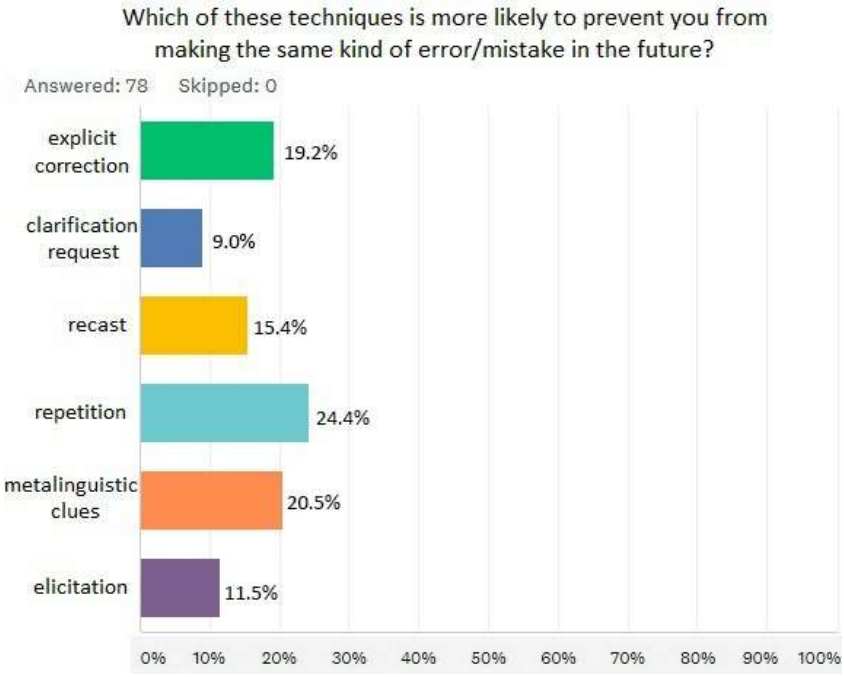
Comparison of teachers' and learners' perceptions of the extent to which errors should be corrected in SLA



According to Havranek and Cesnik (2001), corrective feedback is considered successful if it elicits a corrected version of the original utterance from the learner it was generated by, even if it is a mere repetition of the corrected version of the utterance. Speculations on the optimal type of corrective feedback resulting in student-generated repairs generally lead researchers to viewing self-correction as a highly productive and psychologically relevant strategy. Self-correction may 'enable students to have more autonomy in learning, requiring that they take responsibility in the process of monitoring their own errors' (Hong, 2004, p. 14).

Whether foreign language learners are capable of self-correction or teacher-generated corrective feedback is often dependent on their L2 level, which is also the case with particular error correction techniques they are more responsive to. In this respect, Perdomo (2018) rightly points that the level of L2 proficiency is an important factor influencing the decisions on the type of corrective feedback chosen. We strongly support Nicholas et al. (2001), who state that the effectiveness of corrective feedback depends on 'the overall developmental level of proficiency or interlanguage variety of the learner' (Nicholas et al., 2001, p. 752). Therefore, in order to answer the key question in our survey (Fig. 7) students were to specify their English proficiency level before choosing the error correction technique which they considered to have the strongest preventative effect.

Figure 7
Distribution of students' choices of the error correction technique perceived as having the strongest preventative effect



Interpretation of the data obtained was a complex task. We formed an interim table in which the sorted responses were distributed according to the ESL learners' proficiency level (Table 1).

Table 1
Results from an online survey of 78 respondents. Responses to the question 'Which of these techniques is more likely to prevent you from making the same kind of error?'

Level	Error correction technique											
	explicit correction		clarification request		recast		repetition		metalinguistic clues		elicitation	
B1	3	21%	1	13%	3	27%	4	19%	3	18%	4	57%
B2	7	50%	6	75%	5	45%	13	62%	9	53%	3	43%
C1	4	29%	1	13%	3	27%	4	19%	5	29%	0	0%
Total	14	100%	8	100%	11	100%	21	100%	17	100%	7	100%

For a more profound analysis of the results obtained in the survey, the probability theory was used, i.e., 'desirability' or 'preference' was evaluated by methods of probability theory. At first glance, it may seem that the a priori probability of a particular student choosing one of the six techniques is known, since we have students' responses to the question 'Which of these techniques is more likely to prevent you from making the same kind of error/mistake in the future?' However, since students' attitudes to the question posed were formed during their classes, and the online survey was conducted later, the probability of students referring to the cohort having chosen a particular method had to be re-evaluated using the Bayes' formula (Gelman, 2013). Let's consider the six hypotheses. Supposedly, a D1 hypothesis suggests that an arbitrarily considered student prefers explicit correction, D_2 hypothesis – the student prefers clarification request, D_3 – the student prefers recast, D_4 – repetition is preferred, D_5 – the preference is given to metalinguistic clues, D_6 – the student opted for elicitation.

Having analyzed the survey results, we obtained the following probability values: $P(D_1)=0.18$, $P(D_2)=0.09$, $P(D_3)=0.15$, $P(D_4)=0.25$, $P(D_5)=0.21$, $P(D_6)=0.12$. Using the classic definition (Jeffreys, 1998), the following was deduced:

$$P(D_1)+ P(D_2)+ P(D_3)+ P(D_4)+ P(D_5)+ P(D_6) = 1.$$

Let's consider the dependent event A – the student's belonging to one of the B1, B2 or C1 level cohorts on the basis of the data from Table 1.

The probability that an arbitrary student belongs to B1 level cohort, provided that they have chosen the D1 hypothesis, is equal to $P_{D_1}^{B1}(A) = 0.21$. Similarly, the probability that English proficiency level of an arbitrarily taken student is B2, provided that they have chosen the D1 hypothesis, is equal to $P_{D_1}^{B2}(A) = 0.50$, and the probability that an arbitrarily taken student is C1 level learner, provided that they have chosen the D1 hypothesis, is equal to $P_{D_1}^{C1}(A) = 0.29$. Similarly,

for D_2 hypothesis: $P_{D_2}^{B1}(A)=0.13$, $P_{D_2}^{B2}(A)=0.75$, $P_{D_2}^{C1}(A)=0.13$
for D_3 hypothesis: $P_{D_3}^{B1}(A)=0.27$, $P_{D_3}^{B2}(A)=0.45$, $P_{D_3}^{C1}(A)=0.27$
for D_4 hypothesis: $P_{D_4}^{B1}(A)=0.19$, $P_{D_4}^{B2}(A)=0.62$, $P_{D_4}^{C1}(A)=0.19$
for D_5 hypothesis: $P_{D_5}^{B1}(A)=0.18$, $P_{D_5}^{B2}(A)=0.53$, $P_{D_5}^{C1}(A)=0.29$
for D_6 hypothesis: $P_{D_6}^{B1}(A)=0.57$, $P_{D_6}^{B2}(A)=0.43$, $P_{D_6}^{C1}(A)=0$

According to the formula of total probability, the probability that the level of an arbitrarily taken student will be B1 is equal to

$$P^{B1}(A)=P(D_1)\cdot P_{D_1}^{B1}(A)+P(D_2)\cdot P_{D_2}^{B1}(A)+P(D_3)\cdot P_{D_3}^{B1}(A)+$$
$$+P(D_4)\cdot P_{D_4}^{B1}(A)+P(D_5)\cdot P_{D_5}^{B1}(A)+P(D_6)\cdot P_{D_6}^{B1}(A)=0.24.$$

The probability that the level of an arbitrarily taken student will turn out B2 is equal to

$$P^{B2}(A)=P(D_1)\cdot P_{D_1}^{B2}(A)+P(D_2)\cdot P_{D_2}^{B2}(A)+P(D_3)\cdot P_{D_3}^{B2}(A)+$$
$$+P(D_4)\cdot P_{D_4}^{B2}(A)+P(D_5)\cdot P_{D_5}^{B2}(A)+P(D_6)\cdot P_{D_6}^{B2}(A)=0.54.$$

The probability that the level of an arbitrarily taken student will be C1 is equal to $P_A^{B1}(D_1)=\dfrac{P(D_1)\cdot P_{D_1}^{B1}(A)}{P^{B1}(A)}=0.16$

Let's suppose the level of a randomly taken student is B1, i.e., the event has already taken place. Therefore, we can calculate a posteriori probabilities using Bayes' formula (Gelman, 2013). The probability of a randomly taken student of B1 level preferring explicit correction is equal to

$$P_A^{B1}(D_1)=\frac{P(D_1)\cdot P_{D_1}^{B1}(A)}{P^{B1}(A)}=0.16.$$

Similarly, for all other students with B1 level:

$P_A^{B1}(D_2)=\dfrac{P(D_2)\cdot P_{D_2}^{B1}(A)}{P^{B1}(A)}=0.05$ – the probability of giving preference to 'clarification request';

$P_A^{B1}(D_3)=\dfrac{P(D_3)\cdot P_{D_3}^{B1}(A)}{P^{B1}(A)}=0.17$ – the probability of giving preference to 'recast';

$P_A^{B1}(D_4) = \frac{P(D_4) \cdot P_{D_4}^{B1}(A)}{P^{B1}(A)} = 0.19$ – the probability of giving preference to 'repetition';

$P_A^{B1}(D_5) = \frac{P(D_5) \cdot P_{D_5}^{B1}(A)}{P^{B1}(A)} = 0.16$ – the probability of giving preference to 'metalinguistic clues';

$P_A^{B1}(D_6) = \frac{P(D_6) \cdot P_{D_6}^{B1}(A)}{P^{B1}(A)} = 0.28$ – the probability of giving preference to 'elicitation'.

$$P_A^{B1}(D_1) + P_A^{B1}(D_2) + P_A^{B1}(D_3) + P_A^{B1}(D_4) + P_A^{B1}(D_5) + P_A^{B1}(D_6) = 1.$$

Similar calculations were made for other B2 and C1 level learners. The results are presented in Table 2.

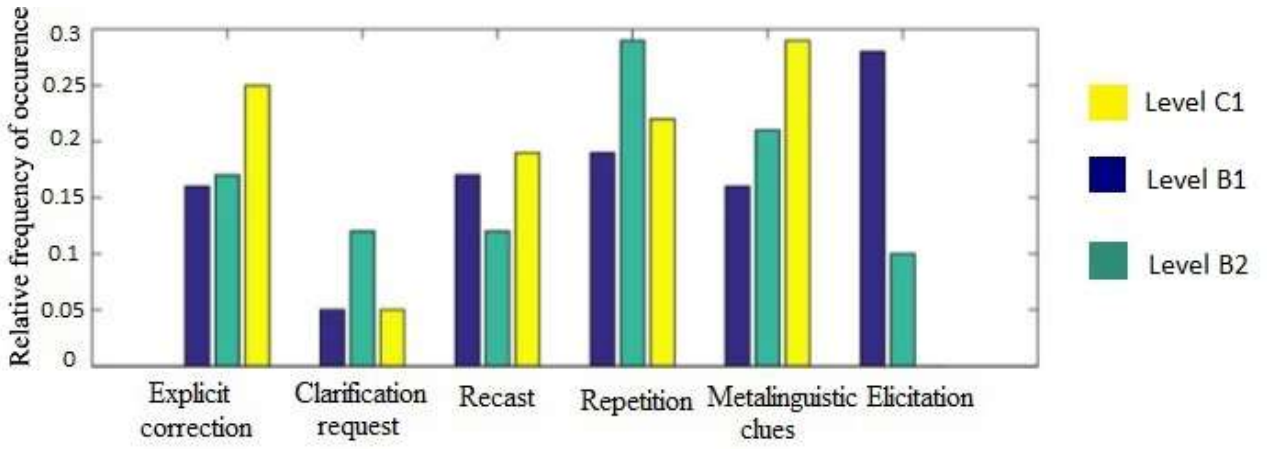
Table 2
The probability of ESL students of B1, B2, and C1 level preferring a particular error correction technique

Level	explicit correction	clarification request	recast	repetition	metalinguistic clues	elicitation
B1	$P_A^{B1}(D_1)$=0.16	$P_A^{B1}(D_2)$=0.05	$P_A^{B1}(D_3)$=0.17	$P_A^{B1}(D_4)$=0.19	$P_A^{B1}(D_5)$=0.16	$P_A^{B1}(D_6)$=0.28
B2	$P_A^{B2}(D_1)$=0.17	$P_A^{B2}(D_2)$=0.12	$P_A^{B2}(D_3)$=0.12	$P_A^{B2}(D_4)$=0.29	$P_A^{B2}(D_5)$=0.21	$P_A^{B2}(D_6)$=0.1
C1	$P_A^{C1}(D_1)$=0.25	$P_A^{C1}(D_2)$=0.05	$P_A^{C1}(D_3)$=0.19	$P_A^{C1}(D_4)$=0.22	$P_A^{C1}(D_5)$=0.29	$P_A^{C1}(D_6)$=0
Mean	.19	.07	.16	.23	.22	.13

Comparing the prevalence of each error correction technique for the three cohorts (B1, B2 and C1 level), we could observe that B1 level learners were inclined to prefer elicitation as a technique that was most likely to prevent them from making the same kind of error/mistake in the future. Within the B2 level cohort, the most preferable error correction technique would be repetition, while C1 level respondents were most likely to opt for metalinguistic clues. Interestingly, the survey demonstrated two opposite students' reactions to elicitation, which was favoured by B1 level learners and neglected by C1 level respondents (Table 2).

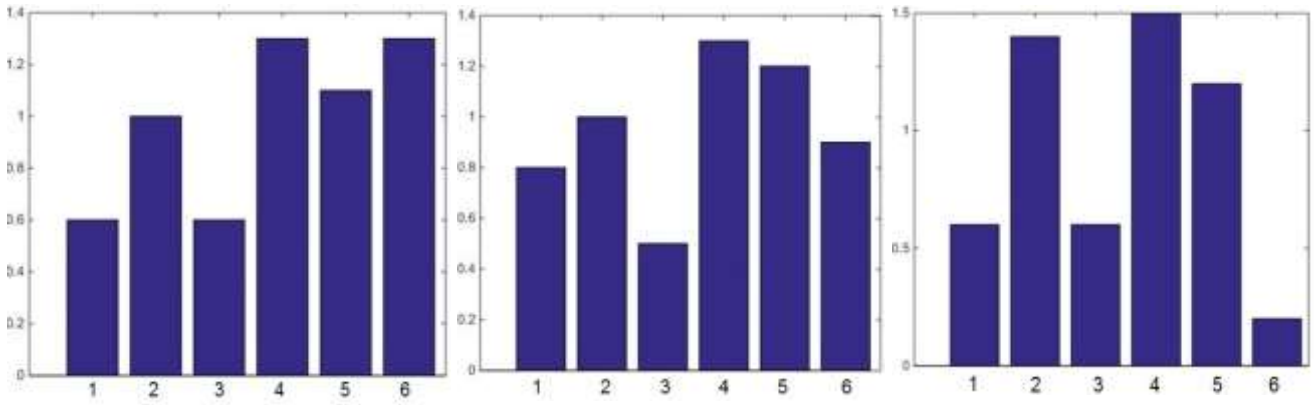
The mean values (Table 2) showed that regardless of ESL students' proficiency level, the most likely error correction technique to be perceived as optimal by all learners was repetition, being followed by metalinguistic clues, while clarification request was the least probable choice for all learners (Table 2; Fig. 1).

Figure 8
Distribution according to students' priorities (Responses to the question 'Which technique is more likely to prevent you from making the same kind of error/mistake in the future?')



Using Osgood's (1952) semantic differential made it possible to measure the perceived effectiveness of each error correction technique based on students' responses. The students were asked to rate the effectiveness of each error correction technique using a bipolar adjective scale ranging from 'extremely ineffective' (-3) to 'extremely effective' (+3) (Fig. 2). The position marked 0 was labeled 'neutral', the 1st positions were labeled 'slightly', the 2nd positions – 'quite', and the 3rd positions – 'extremely'. Error correction techniques in Fig. 9 correspond to the numbers on the horizontal axis: 1 – explicit correction; 2 – clarification request; 3 – recast; 4– repetition; 5 – metalinguistic clues; 6 – elicitation.

Figure 9
Distribution by estimates from -3 to 3 within the groups of B1, B2, and C1 level learners



istribution by estimates from -3 to 3 within the group of B1 level learners

Distribution by estimates from -3 to 3 within the group of B2 level learners

Distribution by estimates from -3 to 3 within the group of C1 level learners

To make the results of this study applicable to any other studies we strived to develop a method by which a teacher, having a group with an arbitrary number of listeners of English levels B1, B2, and C1, would be able to make a precise and well-considered choice of error correction techniques. Practically, this method suggests finding the most effective distribution of error correction techniques applied for a group of students with an arbitrary distribution of B1, B2, and C1 English levels.

Initially, we analyzed the results of the selection in each i-th students' subsample formed by evaluating the students' level of English in the representative group. Matrix $\mathbf{A} = [a_{ik}]_{n \times m}$, $i = \overline{1,n}$, $k = \overline{1,m}$ was obtained, with the coefficients characterizing students' preferences of the *i-th* subsample, where '*n'* is the number of students' levels of English (B1, B2 and C1) and '*m'* – the number of error correction techniques. As a matter of fact, a_{ik} is the probability of a student with *i-th* level of English preferring *k-th* error correction technique. The '*i'* line number indicates the serial number of the English level in the sequence (B1, B2 and C1), and the column number '*j'* is the serial number of the error correction technique in the survey. By definition,

$$a_{ik} = \frac{N_{ik}}{N_i},\ i = \overline{1,n},\ k = \overline{1,m}, \tag{1}$$

where N_{ik} is the number of students of the *i*-th level, who preferred the *k*-th technique, N_i is the total number of the *k*-th level students. In this case, the probabilities in each row of the matrix form a complete group, i.e. $\sum_{k=1}^{m} a_{ik} = 1,\ i = \overline{1,n}$.

Knowing the students' level of English in an arbitrary academic group, a teacher can calculate the vector of coefficients $\mathbf{G} = [g_i]_{1 \times n}$, $i = \overline{1,n}$, which characterize the 'weight' of students referring to a particular English level, where the elements g_i of the vector are defined as $g_i = \frac{N_i}{N}$, where N_i is the number of the *i*-th level students, N – total number of students in the group. It was necessary to find a 'corrected' $\mathbf{A}^*$ matrix for the group participating in the survey through multiplying the matrix rows by the weighting factors g_i that characterize the distribution of English levels in the group

$$\mathbf{A}^* = \begin{bmatrix} g_1 a_{11} & g_1 a_{12} & \dots & g_1 a_{1m} \\ g_2 a_{21} & g_2 a_{22} & \dots & g_2 a_{2m} \\ \dots & \dots & \dots & \dots \\ g_n a_{n1} & g_n a_{n2} & \dots & g_n a_{nm} \end{bmatrix}.$$

The desired weight of the *k*-th error correction technique in the mixture (the relative weight of using each technique in the examined student group) is calculated as the sum of the elements being the columns of $\mathbf{A}^*$ matrix:

$$K_k = \sum_{i=1}^{n} g_i a_{ik}, k = \overline{1,m} \quad (2)$$

The sum of the calculated weight factors $\sum_{k=1}^{m} K_k = 1$.

For the above representative group, the method can be demonstrated as follows. It was expected that as a result we were supposed to get weights matching the results of the survey question 'Which of these error correction techniques is more likely to prevent you from making the same kind of error/mistake in the future?' Building on the survey results and data from Table 1, we formed **A** matrix

$$\mathbf{A} = \begin{bmatrix} 0.17 & 0.06 & 0.17 & 0.22 & 0.17 & 0.22 \\ 0.16 & 0.14 & 0.12 & 0.30 & 0.21 & 0.07 \\ 0.24 & 0.06 & 0.18 & 0.24 & 0.29 & 0 \end{bmatrix},$$

where the number of rows corresponds to the number of levels (B1, B2, C1), and the number of columns reflects the number of error correction techniques. After analyzing the responses to the question 'What is your level of English?' a vector of coefficients was formed $\mathbf{G} = [0.247\ 0.546\ 0.207]^T$. Using the formula (2), weight coefficients were found (Table 3).

Table 3
Comparison of weighting factors obtained by calculating and by experiment

Weighting factors	**Error correction technique**					
	explicit correction	**clarification request**	**recast**	**repetition**	**metalinguistic clues**	**elicitation**
Calculated by the method proposed	.18	.1	.14	.27	.22	.10
According to the survey results	.18	.09	.15	.25	.21	.12

Interestingly, by using the 'corrected' values obtained for the elements of the matrix using the Bayes' formula, we obtained even more accurate results that coincide with the survey results. The accuracy obtained is sufficient to be used in foreign language teaching.

To demonstrate a possible way of transferring these calculations to a different setting, let us suppose a teacher has a group of 12 students, 9 of them at B1

proficiency level, and the other 3 students corresponding to B2 level of English. Applying the suggested method, we can find the vector of the desired weights $\mathbf{K} = [0.16\ 0.07\ 0.16\ 0.22\ 0.17\ 0.23]^T$. Thus, the most effective error correction model for this group should involve: explicit correction (16% of the time spent on error correction), clarification request (7% of the time), recast (16%), repetition (22%), metalinguistic clues (17%), and elicitation (23%).

The method suggested in this study is limited to the levels of English, i.e., it works for a group of students whose English level is not lower than B1 and does not exceed C1, which is quite sufficient in most cases. For a wider range of levels, conducting a similar survey and studying its results could be recommended.

Conclusions

The findings of the study indicated that students had a positive attitude towards teachers' corrective feedback. Three quarters of the teachers agreed on the necessity of treating all students' errors (64%) and all major errors (21%). The students generally had a similar reaction, 56% of them supporting treatment of all students' errors and 15% of the respondents expecting a corrective feedback on all major errors. A disparity was revealed in the respondents' perceptions of limited corrective feedback (correction reduced to errors leading to misunderstanding, hindering communication, and interfering with clarity of expression), which was supported by 9% of the students but completely disregarded by the teachers.

At the same time, as much as one third of the respondents admitted that error correction by the teacher in the classroom could cause psychological discomfort for them or other students. Caution should be taken when considering the timing and manner of corrective feedback to be delivered, since more than one third of the students in the survey admitted having been discouraged by the teacher interrupting their oral production to correct the errors.

Almost half of the students viewed grammar errors as those needing treatment more than others, with lexical errors ranking second and phonological errors being the least urgent according to students' perceptions. In terms of the timing, there was no considerable dominance of either simultaneous or delayed corrective feedback within the current study. The difference in response distribution constituted 5.2% in favour of simultaneous error correction.

In terms of the type of errors that should necessarily be treated in SLA, almost half of the respondents gave priority to morphological and syntactic errors as more urgently requiring corrective feedback; one third of the students treated lexical errors as necessary for correction; while nearly one fifth of the responding students believed that teachers should primarily react to their phonological errors.

The prevailing oral error correction technique used by ESL teachers in the classroom, according to the students' survey, was explicit correction. The second most common type of corrective feedback, which students attributed to teachers, was recast. While clarification request ranked third among the most extensively used error correction techniques in SLA, repetition and metalinguistic feedback were found to

be less common, ranking fourth and fifth respectively. Elicitation appeared to be the most uncommon type of corrective feedback according to the students' responses.

The effectiveness of error treatment in SLA often depends on careful selection of the method, timing and delivering agent of corrective feedback. The optimal range of error correction techniques is, to a large extent, determined by the proficiency level of L2 learners. Understanding the correlation between learners' L2 level and their preferences for corrective feedback could increase their responsiveness and, consequently, the number of student-generated repairs. Therefore, the students' responses to the key question in the online survey, addressing the error correction technique which they considered to be the most effective, i.e. having the strongest preventative effect, were sorted and distributed according to their English proficiency level. Using the probability theory and a posteriori probabilities calculated with Bayes' formula, the probability of a randomly taken student of B1, B2 and C1 proficiency levels preferring one of the six error correction techniques was deduced. Analyzing the prevalence of each error correction technique in each of the B1, B2, and C1 level cohorts, the following tendencies could be observed: B1 level learners were inclined to prefer elicitation. Within the B2 level cohort, the most preferable error correction technique was repetition, while C1 level respondents were most likely to opt for metalinguistic clues. The calculations obtained in the study could be utilized by ESL educators and transferred to their settings. The suggested method could help educators develop the most effective error correction model for their ESL classroom, which would correspond to the students' expectations for the type and the amount of corrective feedback provided.

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