Interpersonal Dynamics and Second Language Acquisition: Investigating the influence of the teacher-student relationship on English vocabulary expansion in the classroom.

by

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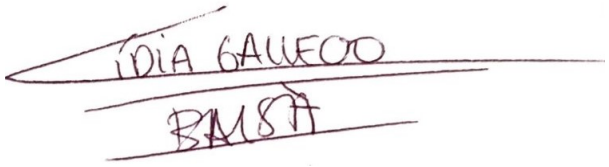

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Master's Final Project
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Interpersonal Dynamics and Second Language Acquisition: Investigating the influence of the teacher-student relationship on English vocabulary expansion in the classroom.

You cannot teach anybody anything; you can only help them to find it within themselves.

– Galileo Galilei

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Abstract

In the burgeoning field of Second Language Acquisition, the Teaching and Learning of English as a Foreign/Second Language is an area of education which is particularly buoyant worldwide. However, learning a new language appears to be easier for some than for others. Literature to date points to the multifactorial nature of this pedagogical process with extensive scholarly and scientific exploration and investigation from many different angles yielding an abundance of valuable observations and insights. The present body of research seeks to continue this empirical inquiry and aims to draw on relational findings from Applied Psychology in the service of greater understanding and improved learning outcomes in the field of Applied Linguistics. This quantitative investigation examines the interplay between teacher-student dynamics and English vocabulary learning in the classroom using a repeated-measures study design with a pre-intervention post-intervention model on a sample size of 39 Catalan primary school students. The results are then subject to a Bayesian statistical analysis with the application of a General Linear Model using the JASP software program. The non-normal distribution of the teacher-student relationship quality data exhibited overly positive results which is indicative of potential limitations in certain aspects of methodology planning, such as the participant age-profile and intervention duration. This study highlights the importance of anticipating and offsetting potential confounding variables such as the Novelty Affect and Social Desirability Bias and outlines proposed revisions for future studies in this area.

Keywords: second language acquisition, teacher-student relationship, teaching and learning English as a foreign/second language

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List of Abbreviations

A2	Pre-intermediate
ANOVA	Analysis of Variance
CEFR	Common European Framework of Reference for Languages
CEIPSA	Ethics Committee for Research in People, Society, and the Environment
CI	Confidence Interval
EFL	English as a Foreign Language
EL2	English as a Foreign/Second Language
EVE	English Vocabulary Expansion
EVEQ	English Vocabulary Expansion Questionnaire
JASP	Jeffrey's Amazing Statistics Program
L1	First Language/Mother Tongue
L2	Foreign/Second Language
L2WTC	Learners' Willingness to Communicate in a Second Language
QTSR	Quality of the Teacher Student Relationship Questionnaire
RMSE	Root Mean Squared Error
SLA	Second Language Acquisition
TLEL2	Teaching and Learning English as a Foreign/Second Language
TSR	Teacher-Student Relationship
TSRQ-Q	Teacher-Student Relationship Quality-Questionnaire
URV	Universitat Rovira i Virgili
WTC	Willingness to Communicate

Introduction

Teaching and Learning English as a Foreign/Second Language (TLEL2) in the classroom implies two activities, one on the part of the English as a Foreign/Second Language (EL2) teacher, who is teaching, and one that emanates from within the EL2 student, who is learning. The classroom setting inevitably assumes the activity of teaching, which involves the deliberate preparation and instruction of the target content by a competent and officially qualified educator. There is ongoing research and debate within academia and among EL2 instructors as to the ways in which Second Language Acquisition (SLA) can be optimized in this specific environment, and there is no shortage of studies, articles, books, opinions, and beliefs pertaining to the merits of various teaching approaches, methodologies, techniques and much more in relation to TLEL2 specifically, and to SLA in general (Richards & Rodgers, 2001; Tavakoli & Jones, 2018). Many, if not all, of these convictions, views, and research study findings can be broadly accepted as valid observations in their own right, but the overarching message to emerge is summed up quite well by Betal and Banerjee (2023), who highlight the complex and dynamic nature of TLEL2, while promoting the critical need to create optimal learning environments for students. In a well-presented overview of individual difference in SLA, this argument is expanded upon by Dörnyei (2005), who advocates for the "integration of linguistic and psychological approaches in a balanced and complementary manner" (p. 219)

Learning a new language in the classroom setting can be quite arduous, it involves the process of change (Sequiera, 2012), which in and of itself implies the actions of sustaining a commitment, of persevering despite setbacks, of self-observation and self-discovery, all of which lead to what Bouckenooghe et al. (2009) refer to as a readiness or a resistance to change in the learner. For many people deliberate change in general can be quite difficult, and indeed for a sizeable number the process of learning a second language may only be possible

to a certain degree, due to a variety of idiosyncratic learner limitations involving biophysiological constraints and sociocultural factors (Benson & Nunan, 2004; Larsen-Freeman, 2018), as evidenced in interlanguage diversity and fossilization (Selinker, 1972; Chidi-Onwuta, 2022; Wang & Fan, 2020). There are proponents of the primacy of phenomena such as comprehensible input (Krashen, 1987) in SLA, while others point to the multifactorial nature of new language learning (Ellis, 1994), thereby highlighting issues such as the role of the learner's mother tongue (L1), age, aptitude, and motivation, to name but a few.

It transpires that under the umbrella terms of teaching and learning lie a multitude of interacting and overlapping components that conspire in distinct ways to facilitate, or sometimes hinder, the learning process. In fact, intriguing research from Backtash and Taheri (2021), which alludes to Long's (1996) Interaction Hypothesis, posits that in many cases, Foreign/Second Language (L2) learners do not necessarily even learn what teachers teach, rather they absorb and integrate linguistic snippets of information according to their immediate idiosyncratic needs and personal motivations. Given this complex and nuanced interplay between teaching and learning, it stands to reason that it would be foolhardy to overlook the influence of the learning experience itself, as perceived by the learner, on L2 learning outcomes. Contemporary research exploring student's lived experiences of learning English in the classroom point to the detrimental impact of an anxious environment (Cortez & Real, 2021; Soriano & Co, 2022), which speaks to the subjective emotional and psychological dimension inherent in learning a second language. Indeed, one renowned scholar who argues for the need to place more emphasis on the impact of affect and emotion in SLA, both in terms of epistemology in research endeavors and of methodology in the classroom is Dewaele (2005). To that end, there is an often under-considered yet undeniable entity that comes into play when considering the influence of affect on change in the context of new learning under

the auspices of a teacher in SLA, that of the relational interplay between said teacher and the student.

The power of the relationship has long been studied in the field of Applied Psychology and it is widely accepted that it is often the primary driver of positive outcome in behavior modification endeavors (Reis et al., 2000), most notably in the context of a professional relationship grounded in mentorship and guidance (Lambert & Barley, 2001). Despite ongoing debate attached to methodological and definitional aspects of Krashen's proposed hypotheses of SLA (Doncaster & Hughes, 2003), there are voices who argue that his work has simply been misunderstood by many, even up to the present day (Lichtman & VanPatten, 2021). For the purposes of this investigation, Krashen's (1987) Affect Filter Hypothesis will be considered to the extent that a L2 learner's ability to learn is in no small part influenced by internal psychological and emotional factors (Zheng & Cheng, 2018), via interpersonal dynamics between the teacher and the student. Of particular interest will be the exploration of the significance and transferability of relational findings from the Common Factors Model (Lambert, 1992) to the field of SLA, as a pathway to lowering learners' affective filters, and improving EL2 learning outcomes in the classroom.

Hence, the purpose of this body of research is to consider and explore the actual effect of the teacher-student relationship (TSR), via the students' affect filter, on the language learning process in the classroom setting. The relevance and applicability of available scientific literature in relational dynamics and behavior modification in the field of Applied Psychology will be presented and explained, alongside a proposed integration and investigation of said relevant findings, when transferred to the domain of Applied Linguistics. This constitutes the focus of investigation for this study, which will investigate and analyze if and how the TSR impacts SLA, specifically in relation to English vocabulary expansion (EVE) in the EL2 classroom. Therefore, in order to address the stated objective, the study

design and choice of methodology has been tailored to endeavor to answer the following research questions and to examine the stated hypotheses:

Research Questions

- Does the teacher-student relationship influence English vocabulary expansion in the classroom?
- How does the teacher-student relationship influence English vocabulary expansion in the classroom?
- What are the specific variables within the teacher-student interactions that have a significant influence on English vocabulary expansion in the classroom?

Hypothesis Statements

- $H_0$1 = The teacher-student relationship does not have an influence on English vocabulary expansion in the classroom.
- H_α1 = The teacher-student relationship does have an influence on English vocabulary expansion in the classroom.
- $H_0$2 = A positive teacher-student relationship is not positively correlated with English vocabulary expansion in the classroom.
- H_α2 = A positive teacher-student relationship is positively correlated with English vocabulary expansion in the classroom.

Theoretical Background

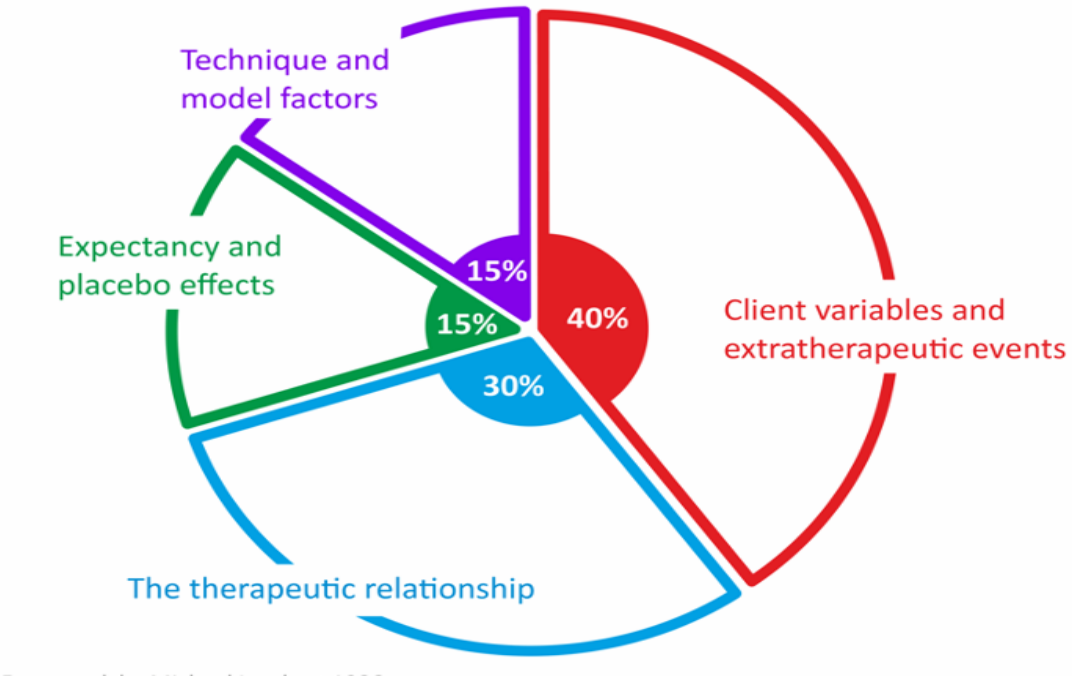
There is a concept in Applied Psychology, referred to metaphorically as the “Dodo bird verdict”, which is in reference to a scene in the book Alice in Wonderland by Carroll (1984), where the dodo bird proclaims, “Everyone has won and all must have prizes”. This

analogy was adopted by Rosenzweig (1936) to make the contentious proposal at the time, that psychotherapeutic outcomes have much less to do with specific approaches, if at all, than had been previously believed. This marked the beginning of a lively discussion on the topic over the ensuing decades, which culminated in influential work by Lambert (1992), summarizing psychotherapy outcome research by Lambert et al. (1986), subsequently corroborated by Hubble et al. (1999), and later by Luborsky et al. (2002). Although the debate lingers to a certain degree as to the weight of specific approaches on positive psychotherapeutic outcome (Cuijpers et al., 2019), the bulk of the scientific literature repeatedly supports Lambert's (1992) results and conclusions and indeed, this is further exemplified by recent high-quality research presented by Wampold (2015), which documents an updated review of the findings through extensive coverage of meta-analyses of primary studies. In the latter paper, the significance of relational dynamics, in combination with the deliberate and purposeful use of expectations to promote positive therapeutic outcomes, is presented as part of a contextual model to provide a theoretical premise for Lambert's (1992) research implications.

The findings from the work referenced in the previous paragraph, often referred to as Lambert's Pie, or the Common Factors Model (Lambert, 1992), reinforce and portray Rosenzweig's (1936) initial contention in the form of a pie chart as shown in Figure 1, illustrating that positive change in psychotherapy is essentially mediated by 4 universal and overarching factors. According to these findings, and despite resistance from psychotherapeutic modality purists (Falzon et al., 2010), the most important predictors of positive change in client outcomes are largely due to a combination of extra therapeutic determinants and client attributes alongside the quality of the therapist-client relationship. In fact, to be precise, this work suggests that up to 70% of the positive psychotherapeutic outcome is contingent upon the relational interplay between the therapist and the client during the treatment sessions.

Figure 1

Lambert's Pie



Note. Lambert's Pie Chart reflecting a proportionate overview of the common factors which influence positive psychotherapeutic outcome.

As can be seen from Figure 1, this research effectively serves to minimize the influence of specific approaches and techniques while highlighting the role of client variables and the therapist-client relationship. Moreover, work from Blease and Kirsch (2016) underscores the susceptibility of the placebo effect, and indeed the nocebo effect, to the quality of the therapist-client relationship, thereby further emphasizing the transformative power of relational dynamics. Furthermore, recent work on empirically supported treatments as part of a transdiagnostic approach to psychotherapy by Hofmann and Barlow (2014), draw attention to parallels with the Common Factors Model outlined above.

The logical hop from psychological theory to pedagogical instruction has already largely been established when considering the effect of the TSR on a variety of positive learning outcomes (Pianta, 2006; Cornelius-White, 2007; Robinson, 2022). This body of knowledge serves to reinforce the significance of the power of the interpersonal dynamic between a trained and qualified specialist in a particular discipline and a student engaged on a path of new learning and positive change. Perhaps the most paradigmatic reference to this phenomenon can be found in earlier work by Vygotsky (1978), with his Sociocultural Theory of Cognitive Development, which shines a spotlight on the relational and interactional impact on new learning and intellectual development.

When these findings are extrapolated to the field of SLA and TLEL2, there are many plausible parallels, most notably the process of change and new learning via the avenue of a productive and beneficial relationship. The learning of a new language has been shown by work in neurolinguistics (Osterhout et al., 2008) to be enhanced by positive experiences in the classroom. The language learner, much like the client in psychotherapy, is engaged in a process of positive change through new learning, facilitated by a fully qualified and professionally certified specialist in the area of concern, in this case, a EL2 teacher. A cursory glance through the literature in SLA clearly reveals a large body of academic research and clinical studies attesting to the beneficial impact of the relationship between the student and the teacher on universal learning processes and outcomes in general (Mallik, 2023; Jowett et al., 2023; Desmet et al., 2023), although these implications do not yet appear to have been extensively investigated in the context of TLEL2. Indeed, relationships in general are arguably what constitute the bedrock of what it means to be human. They are a reflection and manifestation of our intrinsic social nature and need for collaboration and communication to fulfil our individual and collective needs to survive and desires to thrive (Allen et al., 2021). However, as explored by Woods (2014), and indeed clearly demonstrable by a few minutes of

exposure to social media or mainstream news channels today, one quicky observes the ongoing challenges faced by society to understand how to better leverage these essential human interactions for the betterment of humanity. The consideration of the intricacies and role of relationship dynamics in the educational context is essentially a rational and well-founded microcosm of the quest to better understand and optimize the cooperative human experience in the service of wider societal evolution.

Sequiera (2012) describes learning as a relatively permanent change involving the intentional development of a new skill and emphasizes the modern role of the teacher as a facilitator in that process, where the ultimate goal is to encourage active student engagement and participation. Indeed, the process of change involved in SLA has been theorized by Krashen and Terrell (1983) to consist of five predictable and sequential stages: pre-production, early production, speech emergence, intermediate fluency, and advanced fluency. Follow-up work exploring instructional content in a wide variety of second language learning programs from Ramírez (1991, as cited in Cummins, 2001) draw attention to the beneficial educational function of stage-appropriate questions in a nod to Vygotsky's (1978) Zone of Proximal Development and the theory of scaffolding techniques first proposed by Wood et al. (1976). This approach is bolstered by proponents of Complex Systems Theory and indeed, according to Weideman (2010), "Language develops, from a complex systems perspective, in a process of co-adaptation, which gives rise to an alignment of patterns between, for example, learner and interlocutor." (p. 230), in reference to in-depth inquiry and analysis by Larsen-Freeman and Cameron (2008).

Meanwhile, work from Dulay and Burt (1977), later followed by Krashen (1987), in the field of Applied Linguistics, point to the impact of emotional stability on SLA, which Krashen referred to as the Affect Filter Hypothesis in his overarching theory of SLA. This effectively posits that individual variation in SLA is in no small part influenced by learner

affect. To put it simply, a negative emotional state in L2 learners leads to a high Affect Filter which in turn has a detrimental effect on L2 learning outcomes. In more recent years, there has been ongoing exploration into the benefits of a low Affect Filter in SLA, and how best to foster emotional states in students that are conducive to more efficient and effective L2 learning (Ni, 2012; Bao & Liu, 2021; Kiruthiga & Christopher, 2022). The preceding studies strongly support Krashen's proposed Affect Filter Hypothesis with a particular emphasis on the pertinence of common affective factors such as student motivation, self-esteem, and levels of anxiety.

Accordingly, the aim of this study is to examine the relevance of the aforementioned revelatory and universal implications of the Common Factors Model (Lambert, 1992), specifically in the context of relational factors, and to explore the association with the Affect Filter Hypothesis, in the field of SLA in general, and to TLEL2 outcomes in particular. In order to fulfil the purpose of this investigation, the study has been designed and developed to investigate the extent to which the TSR influences EVE in the classroom and furthermore, to identify and explore significant variables within that working alliance which contribute to positive learning outcomes.

Literature Review

"All human interactions are opportunities either to learn or to teach."

(Peck, 1978, p.180)

A large-scale study was designed and undertaken by Song et al. (2022) to identify the correlation between teacher caring behaviors and teacher-student rapport, and 4392 Chinese English as a Foreign Language (EFL) learners' willingness to communicate in a second

language (L2WTC). Results from Spearman correlation analysis of the data reveal significant and positive correlation between teacher caring behavior and L2WTC, alongside a strong and positive correlation between teacher-student rapport and L2WTC. As mentioned in the study, the direct relationship between teacher caring behavior and teacher-student rapport is consistent with findings from Thompson (2018), which revealed pronounced positive correlations between students' perception of teachers' listening quality and students' wellbeing in the learning environment. These findings are further reinforced by results from multiple regression analysis on the same data provided by Song et al. (2022), corroborating longitudinal studies by Martin and Collie (2019,) which found a significant linear effect size between positive teacher-student relationships and student engagement in high school, with a sample size of 2079 participants from 18 different institutions.

Elsewhere, work from Li (2022) on 86 university students in China, using Pearson correlational analysis, 2 independent t tests and one-way ANOVAs (Analysis of Variance), found that learner-internal variables, most notably their emotional state, was enhanced by enjoyment-boosting and boredom-reducing activities. This increase in what the author refers to as foreign language enjoyment was reported to have been primarily achieved by capitalizing on teacher-centered variables such as enthusiasm, L2 use and teacher friendliness, to name a few, which simultaneously had the effect of reducing foreign language learning boredom. Although the overriding message to emerge from this body of research clearly appears to point to the noteworthiness of the teacher-learner interplay, the author also expressed caution as to the tentative nature of the findings, due to reliability and validity concerns with independent variable measurement. In a similar vein, albeit from a different vantage point, a multi-wave longitudinal study on a sample of 784 elementary school students in the US, indicated a reciprocal association between teacher-student interpersonal dynamics and classroom engagement (Hasty et al., 2023). Essentially, the authors reported findings

which showed that a positive TSR led to less acting out in class, higher levels of engagement and less conflicts and vice versa. While the authors in this study do seem to underscore the primary role of externalizing behavior, the results also clearly illustrate a lack of certainty as to the true direction of cause and effect attached to the quality of the TSR.

In a relatively recent sequential mixed-methods approach employed by Thornberg et al. (2020), 234 Swedish children were studied, using Regression Analysis, to investigate the effects of high-quality teacher-student relationships on student engagement over time. In parallel, a qualitative approach was included in this study on a sample size of 120 of 120 children, using focus group interviews and Constructivist Grounded Theory methods to collect and analyze the data. Findings indicate a positive association between teacher-student relationship quality and student engagement (cross sectionally and longitudinally), thus confirming a large body of previous work linking emotionally attuned teacher-student relationships with enhanced student's engagement (Roorda et al., 2017; Hughes & Cao, 2018; Martin & Collie, 2019; Zee & Koomen, 2019). Insights gained from the qualitative arm of the study unearthed sub-categories of the relationship between teachers and students which the authors termed 'teacher being' and 'teacher doing' which gives an indication of the multifactorial nature of the TSR.

A study conducted by Sheybani (2019) delivers some interesting findings. Using Pearson's correlation coefficient and structural modeling, the correlation between 256 Iranian EFL learners' willingness to communicate and teacher's verbal and nonverbal immediacy was investigated. Highest positive correlations were found between teacher's verbal immediacy and speaking WTC (lowest with listening) while highest positive correlations were found between nonverbal immediacy and listening WTC (lowest with writing). A very similar study conducted by Cai (2021) on 858 Chinese EFL students, likewise, using the Pearson correlation coefficient and structural modelling to analyze the data, also revealed that the

students' willingness to communicate was directly proportional to teacher's immediacy and teacher-student rapport. Both studies tap into the notion of teacher's immediacy, a term originally coined by Mehrabian (1969), and revisited by Derakhshan (2021), who linked it to teacher-student rapport. Once again, the predominant take away message from these two bodies of work convey the significant impact of particular characteristics of the TSR on specific aspects of the language learning environment in the classroom, most notably EFL learners' willingness to communicate in class.

According to recent research into the establishment of positive educational relationships between educators and undergraduate students (Govindaraju & Seruji, 2022), effective communication enhances the educational relationship. Meanwhile, a paper that appeared in the International Journal of Multidisciplinary Research and Analysis this year provides evidence that indicates the positive correlation between collaborative learning and academic performance (Cagatan & Quirap, 2024), thereby drawing attention to the impact of the relational attribute of collaboration in educational relationships. Finally, the spotlight is directed towards the specialty of positive psychology and work from Roffey (2017) who outlines in great detail the importance of a supportive learning environment through the pillars of 'learning to be' and 'learning to live' together. Consequently, the three relational qualities of collaboration, communication and support would appear to be valid variables to specifically consider when endeavoring to delve deeper into the investigation of the quality of the TSR in the classroom.

The preceding exploration and presentation of a sample of the literature serves to provide a flavor of what has been undertaken to date with respect to the interaction between the TSR and TLEL2. In essence, this body of research displays prior studies that have investigated specific features of the TSR and their influence on various aspects of learners' affective filters, in a nod to Krashen's (1987) Affect Filter Hypothesis. It transpires that there

are a multitude of ways in which the TSR can be acted upon in order to encourage reduced negative affect and increased wellbeing in the L2 learner. However, there appears to be a paucity of studies which explicitly explore the direct link between a lowered Affect Filter in students, via the TSR, and L2 learning outcomes. Hence, it is the overall aim of this study to build on available research findings to date, and to begin to bridge the gap in knowledge which emerges from this literature review, as previously articulated in the final paragraph of the theoretical background to this paper.

Methodology

This investigation consists of a within-subject study design with the application of a pre-intervention post-intervention model and the administration of a level-appropriate (Council of Europe, 2001) English lexicon proficiency assessment tool – the English Vocabulary Expansion Questionnaire (EVEQ), before and after the intervention period, alongside the simultaneous post-intervention administration of a specifically formulated five scale Likert style questionnaire – the Quality of the Teacher-Student Relationship Questionnaire (QTSR), to assess the participants' perceived experiences of the teaching and learning relational dynamics. The data was collected with the use of Microsoft Word Forms (see Appendices C & D) for the aforementioned questionnaires and the subsequent data analysis was undertaken using the Bayesian statistical analysis interface JASP (JASP Team, 2024). This consisted of a linear regression and t-test analysis of the results to investigate the influence of teacher-student relational dynamics on EVE in the classroom.

Sample

The participants in this study consisted of a group of 39 fourth grade primary school students (22 female and 17 male) in a semi-private school in Tarragona, Spain. The ages of

the participants were between nine and ten years old at the time of the study and this specific cohort was comprised of bilingual, native Catalan/Spanish speakers. Due to the young age profile of the student participants, the research protocol for this study was presented to, and approved by, the Ethics Committee for Research in People, Society, and the Environment (CEIPSA) in the Universitat Rovira i Virgili (URV).

The participants had all been studying English, for two hours per week, as part of the school curriculum for five years prior to commencement of the study, and their English level of proficiency is estimated to be at CEFR (Common European Framework of References for Languages) pre-intermediate level (A2). It was initially planned to administer an English Level Placement Test to determine a precise and up-to-date representation of the participants' CEFR level but due to time and organizational constraints this was not possible, therefore their estimated level of proficiency of A2, as communicated by the school, was used as a reference for the purposes of the study.

There were initially 53 participants included as part of the study but seven of these had to be removed due to either inconsistent or incorrect use of anonymized identifiers during the data collection process, which rendered their results disparate and incoherent. There were also seven participants who scored over a certain threshold in the pre-intervention EVEQ who were removed from the study because any possible growth in EVE would be too insubstantial to use as a meaningful comparison with the results from the QTSR.

The study was undertaken during a practicum module of a Master's Degree at the school while acting as a trainee EL2 teacher and the participants were drawn from one of the researcher's classes, therefore this sample constitutes a convenience sample. Given the young age profile of the student participants, and in adherence with the URV Ethical Committee guidelines, a participation information sheet was provided to the students' legal guardians and

a completed informed consent form authorizing student participation was mandatory for inclusion in the study (see Appendix A).

Materials

The teacher-student relationship quality questionnaire (TSRQ-Q), a scientifically validated psychometric instrument designed by Jowett et al. (2023), was adapted and modified to create the post-intervention self-report 30-item QTSR, which was specifically conceived to evaluate the TSR for the purposes of this study. In particular, the QTSR was designed with three distinct subsections, as previously elucidated in the literature review section, which were purposefully developed to assess the participants' perceived quality of the interactional dynamics of collaboration, support, and communication. This was made available in the participants' L1 - Catalan (see Appendix D) to facilitate comprehension and response accuracy. This QTSR was pilot tested by a selection of peer students, a Catalan university professor and a Catalan primary school teacher using a five scale Likert Pilot Test feedback questionnaire (see Appendix E) and was deemed appropriate for the purposes of this study.

The initial plan was to use a modified Likert scale format to cater to the young age profile of the participants by replacing the traditional rated scale (using verbal statements) with the Effective Smiley Face Likert Scales using emojis (see Appendix B), as suggested by Hall et al. (2016), in an endeavor to both optimize accurate and appropriate response differentiation, and to mitigate Social Desirability Bias (Crandall et al., 1965; Nikolopoulou, 2023). Unfortunately, due to copyright restrictions and a lack of suitably comparable alternative emojis available to select on the Microsoft Forms interface, this option was not possible and a five-star Likert scale (see Appendix B) was chosen as the most suitable compromise solution when considering the youthful age range of the participants.

Adopting a within-subject study design, an English Vocabulary Expansion pre-intervention and post-intervention questionnaire (EVEQ), which consists of a 30-item multiple-choice assessment was employed to measure learning gains of target vocabulary and grammar point using Microsoft Forms (see Appendix C). The EVEQ was pilot tested by a selection of peer students using the same Pilot Test questionnaire applied to the QTSR and was considered appropriate for the purposes of this study. Both questionnaires were administered using Microsoft Forms through a dedicated URV student Microsoft 365 account to ensure a consistent and transparent testing environment and to adhere to the data protection protocol required by the URV Ethics Committee.

Procedure

The CEFR level of A2 was used as a reference for the EVEQ and the lesson over the instructional intervention between pre and post EVEQ was planned and developed in accordance with level-appropriate content (Council of Europe, 2001). Participants were provided with unique code identifiers to ensure matched responses across questionnaires and to preserve anonymity with the deletion of all personal identifiers.

The data collection consisted of administration of the EVEQ pre-intervention (30 item, multiple choice, recognition format and level appropriate) and post-intervention to examine individual EVE over the test period, alongside the post-intervention administration of the QTSR instrument, to evaluate the quality of the TSR from the student's perspective, over the same period. No time limit was imposed on the participants for completion of the questionnaires in an effort to mitigate any imprecisions or missteps due to hurried responses and prioritizing questionnaire completion over item response accuracy.

The intervention consisted of one lesson delivered over two classes (for a total duration of 90-minutes). This was carried out by the researcher, acting in their capacity as a trainee EL2 teacher, under the supervision of the permanently assigned teacher and tutor

during the practicum placement module of a Master of Arts Degree in Teaching and Learning English as a Foreign/Second language at the URV in Tarragona in the Catalonian region of Spain. The lesson consisted of a variety of exercises and activities which were presented and instructed using a Slideshow presentation (see Appendix O). The instructional content included a mix of selected and created materials designed to cover the relevant lexical items and grammar points required for successful completion of the EVEQ. During the intervention period the student participants were taught exclusively by the researcher, acting in their capacity as trainee EL2 teacher and no 'out of the ordinary' or deliberate effort was made to unduly influence the TSR in any way.

The data was collected from the EVEQ pre-intervention and post-intervention, alongside the QTSR post-intervention, and this data was inspected, sorted, and tallied (see Appendices F, G, H, I) using Microsoft Excel and stored in an exclusive and specifically assigned folder on the URV Microsoft One Drive. The 39 participant responses eligible to be retained for the study were then subjected to a multivariate data analysis using a General Linear Model, and more specifically a linear regression test, using JASP (JASP Team, 2024), the free and open-source program for Bayesian statistical analysis supported by the University of Amsterdam, to measure and compare the correlations between the target vocabulary learning over the test period and the quality of the teacher-student relationship, from the participants' perspectives, over the same period.

Results

The following is a presentation of the data collection and analysis subsequent to the administration of the testing instruments on the selected sample of participants, before and after the intervention, as outlined in the Materials and Procedure sections of this paper. The

data collected from the pre-intervention and post-intervention EVEQ was calculated, coded, and tallied using Microsoft Excel and then saved as a csv file (see Appendix F). This file was then entered into JASP and a Paired Samples t test was performed to compare mean scores, control for individual differences, and assess for reliability (see Appendix J).

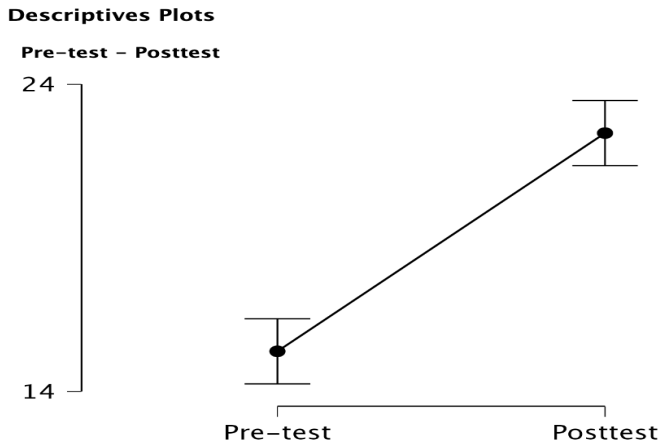
The data collected from the QTSR was numerically coded and scored using Microsoft Excel (see Appendix G). This was then further analyzed and broken down into distinct themes with separate additional columns allocated for the three sub-categories of Collaboration, Support and Communication and saved as a csv file (see Appendix H). The totality of the EVEQ score and QTSR score, including the aforementioned three sub-categories, were then consolidated (see Appendix I) and JASP was employed to conduct a multiple linear analysis on the assembled data using a General Linear Model in lieu of a Pearson's Correlation, due to the relatively small sample size below the requisite 500 necessary for sufficient statistical power.

EVEQ Results

The results displayed in the descriptives contingency table from the Paired Samples t-test analysis on the pretest show a mean of 15.308 and a standard deviation of 5.376. The posttest results reveal a mean of 22.410 and a standard deviation of 5.009. This data clearly shows that the participants performed higher following the intervention period as displayed in Figure 2, and the difference between the tests is significant with $t(38) = 9.598$, $p < .001$ with a very large Cohen's d effect of 1.537. The 95% confidence interval for the mean difference ranged from -1.998 to -1.066. The JASP contingency tables of results can be found in Appendix J.

Figure 2

EVEQ Pre-intervention vs Post-intervention



Note. Descriptives Plot which displays EVE progress over the test period.

Linear Regression

Using JASP, the combined data collection featuring the participants' EVEQ scores and their responses to the QTSR, with an additional delineation of three distinct underlying themes of Collaboration, Support and Communication in three separate columns, was uploaded and subjected to a multivariate analysis using a linear regression test which is explained in the following subsections.

EVEQ score vs QTSR score

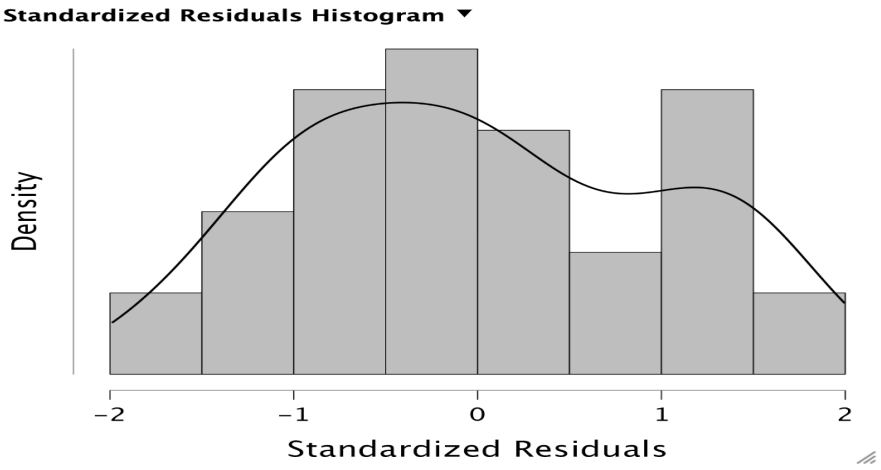
A linear regression test was undertaken on the resultant EVEQ score from the pre-intervention and post-intervention questionnaires and the overall QTSR score using the JASP software program. Due to the particular sensitivity of Linear Regression Tests to outliers, the first step of this analysis consisted of an examination of the standard residuals. These were found to be between -1.881 and 1.853 which remains within the limitations of -3.29 and 3.29, thereby ensuring the absence of any outliers in the data as displayed in Figure 3. The JASP contingency tables of results can be found in Appendix K.

Preliminary observations

Although the results from the linear regression residuals indicate no outliers in the data, as can be clearly observed from the standardized residuals histogram in Figure 3, they do not present a well-formed Bell Curve as would be expected and are indicative of a discrepancy somewhere within the data set.

Figure 3

Test for Outliers EVEQ vs QTSR

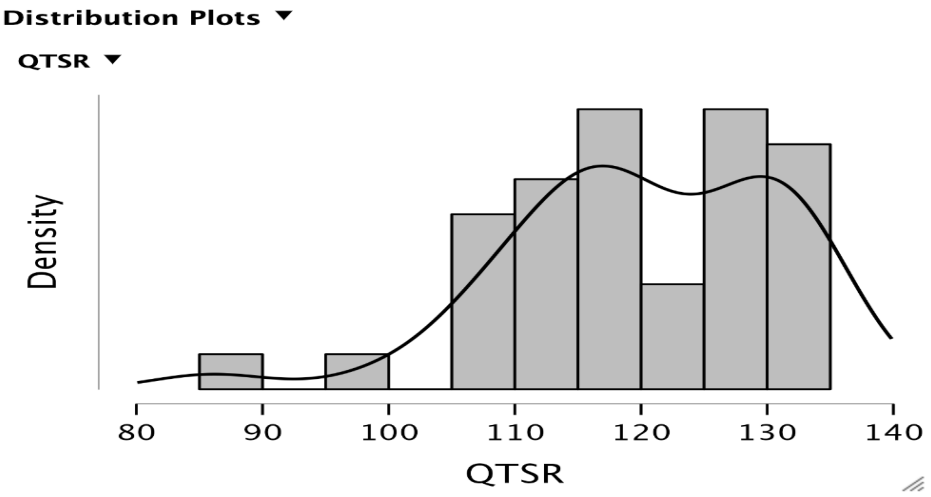


Note. Standardized Residuals Histogram which indicates an absence of outliers in the data.

Therefore, the next step involved the use of the Shapiro-Wilk test to check the distribution of the data even though the sample size was greater than 30 participants which exceeds the threshold under which normality cannot be assumed. According to the Shapiro-Wilk test, the data analysis of the QTSR results reveals a p value of 0.025 which is significant and indicative of data that is not normally distributed thereby communicating that the data is skewed for the independent variable.

Figure 4

QTSR Distribution Plot



Note. Graphical presentation of the highly positive skew of the TSR scores

This prompted a closer examination of the QTSR data and as graphically presented in the distribution plot in Figure 4, the scoring of the TSR items is distributed with a highly positive skew, and this is also confirmed with the Descriptives table data indicating a mean of 120.231 with a standard deviation of 10.857 (see Appendix K). Thus, from the outset of the data analysis there is a clearly observable anomaly in the data which will have a non-negligible impact on the overall results of the study.

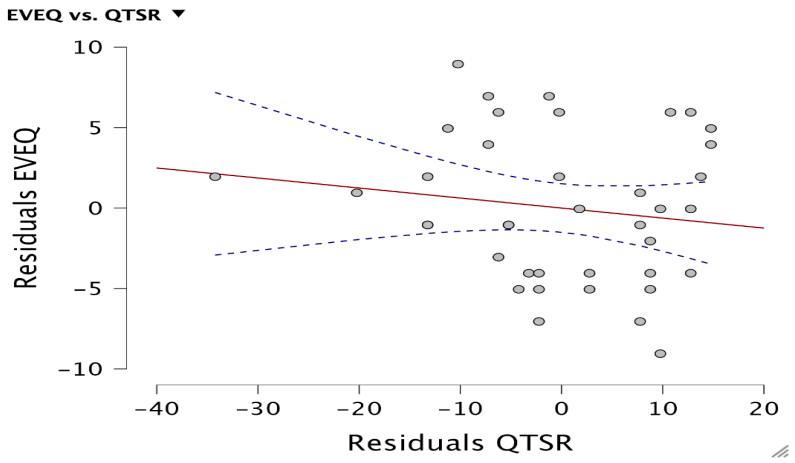
Moving into the next planned phase of the analysis, the results from the Descriptives contingency table reveal a mean of 7.051 for the dependent variable (EVEQ Score) with a standard deviation of 4.588 while the mean for the independent variable (overall QTSR score) is 120.231 with a standard deviation of 10.847, which is very high and heavily skewed to the positive. Examination of the results upon running the Linear Regression test beginning with the Model Summary contingency table in JASP indicate a correlation coefficient R = 0.147, and a standard estimation error RMSE = 4.599 which indicates no meaningful relationship between the predictor (overall QTSR score) and the criterion (EVEQ score) over

the testing period. The ANOVA table shows an F-value of F(1, 38) = 0.820 and p < .371 which is not statistically significant.

Further analysis of the data from the Coefficients table reveals a standardized coefficient of r(38) = -0.147, p = 0.371, and 95% Confidence Interval (CI) of -0.906 to 0.371, which demonstrates no significant correlation between the EVEQ score and the QTSR score over the testing period , which can be clearly visualized in the Partial Regression Plot in Figure 5.

Figure 5

Partial Regression Plot



Note. Plot presenting the relationship between EVEQ score and QTSR score.

The results that emanate from this statistical analysis indicate that while there are no outliers in the data, the QTSR results are not normally distributed and the linear regression is not significant at the common threshold of 0.05. This effectively represents a non-existent predictive relationship of the QTSR score on the EVEQ score, which is not unexpected given the earlier Shapiro-Wilk test findings indicating that the QTSR data is not normally distributed.

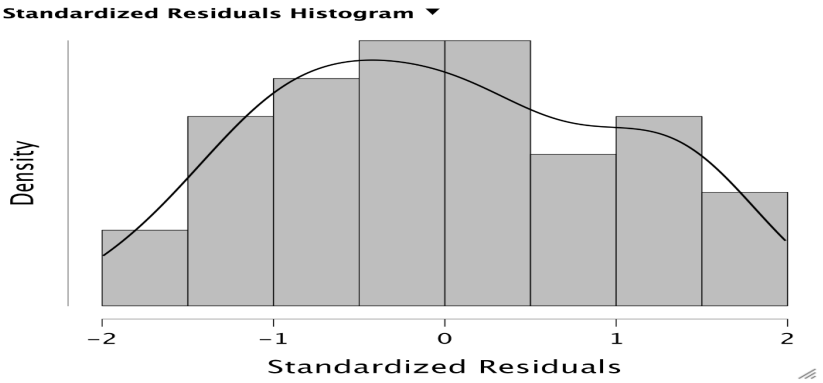
EVEQ vs Collaboration

(see Appendix L for JASP contingency tables of results)

When the EVEQ score is run against the first sub-theme of Collaboration in the QTSR, the results displayed in the Descriptives table show that the mean of the dependent variable remains the same at 7.051 as does the standard deviation at 4.588 while the mean for the independent variable is measured at 39.256 with the standard deviation at 4.247. The Residuals Statistics table show the standard residuals are between -1.903 and 1.837 thereby ensuring the absence of outliers as displayed in Figure 6. The JASP contingency tables of results can be found in Appendix L.

Figure 6

Test for Outliers EVEQ vs Collaboration



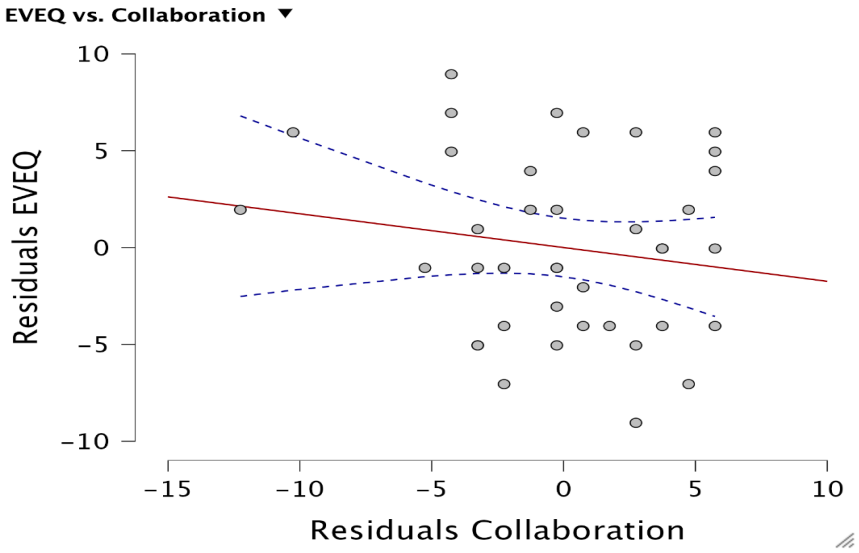
Note. Standardized Residuals Histogram which indicates an absence of outliers in the data.

Results from the Model Summary table in the Linear Regression Test which was carried out on the EVEQ score and the Collaboration theme from the QTSR show a lack of a meaningful relationship between the predictor and the criterion with a correlation coefficient R = 0.161 and a standard estimation error RMSE = 4.589. The results displayed in the

ANOVA table indicate that the independent variable did not significantly predict the EVEQ score with F(1, 38) = 0.990, p = 0.326. The standardized coefficient of r(38) = -0.161 with p = 0.326 with Confidence Intervals 95% CI = -0.529 to 0.181 is demonstrative of an absence of a statistically significant positive correlation between the variables over the testing period, as displayed in the Partial Regression Plot in Figure 7.

Figure 7

Partial Regression Plot



Note. Plot presenting the relationship between EVEQ score and Collaboration score.

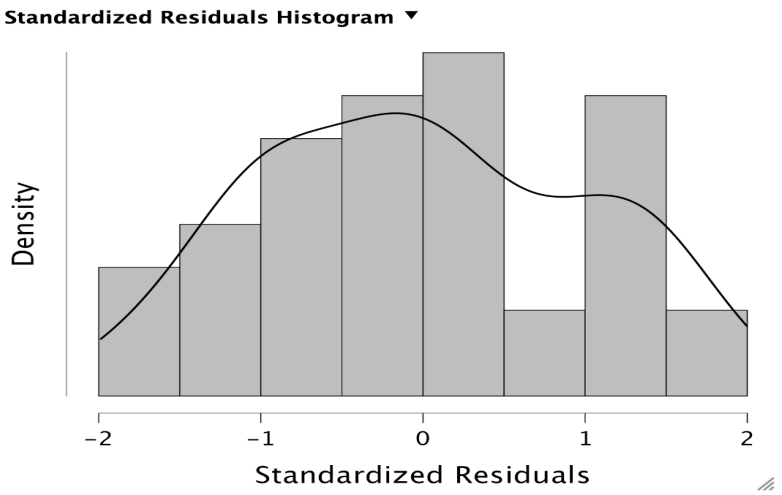
Once again, given the lack of a normal distribution for the QTSR data, the linear regression is not significant at the common threshold of 0.05. This effectively represents a non-existent predictive relationship between the sub-category of Collaboration within the QTSR and the EVEQ score, which is not unexpected given the earlier Shapiro-Wilk test findings indicating that the overall QTSR data is not normally distributed.

EVEQ vs Support

When the EVEQ score is run against the second sub-theme of Support in the QTSR, the Descriptives table shows that the mean of the dependent variable remains the same at 7.051 as does the standard deviation at 4.588 while the mean for the independent variable is measured at 42.872 with the standard deviation at 2.966. The standard residuals are between -1.958 and 1.925 thereby ensuring the absence of outliers as portrayed in Figure 8. The JASP contingency tables of results can be found in Appendix M.

Figure 8

Test for Outliers EVEQ vs Support



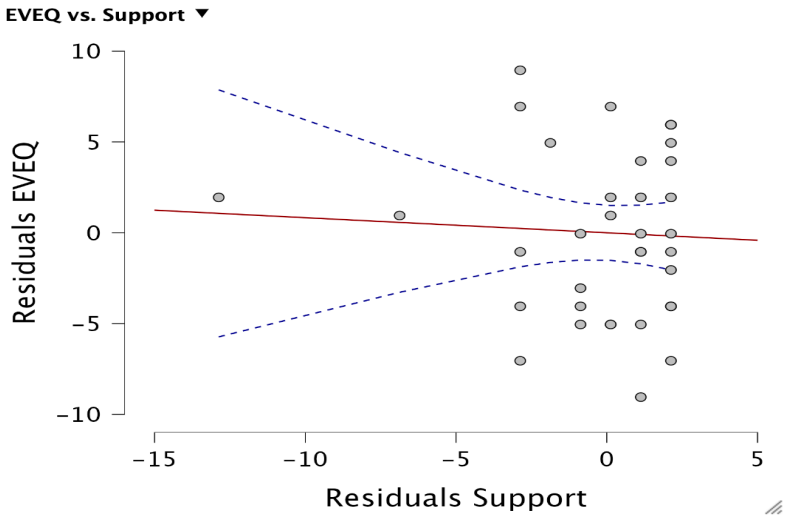
Note. Standardized Residuals Histogram which indicates an absence of outliers in the data.

Results from the Model Summary table in the Linear Regression Test which was carried out on the EVEQ score and the Support theme from the QTSR show a lack of a meaningful relationship between the predictor and the criterion with a correlation coefficient R = 0.054 and a standard estimation error RMSE = 4.643. The

results displayed in the ANOVA table indicate that the independent variable did not significantly predict the EVE score with an F-value F(1, 38) = 0.107, p = 0.746. The standardized coefficient of r(38) = - 0.054, p =0.746 with Confidence Intervals 95% CI = -0.597 to 0.431 thereby revealing an absence of a statistically significant correlation between the variables over the testing period, as displayed in the Partial Regression Plot in Figure 9.

Figure 9

Partial Regression Plot



Note. Plot presenting the relationship between EVEQ score and Support score.

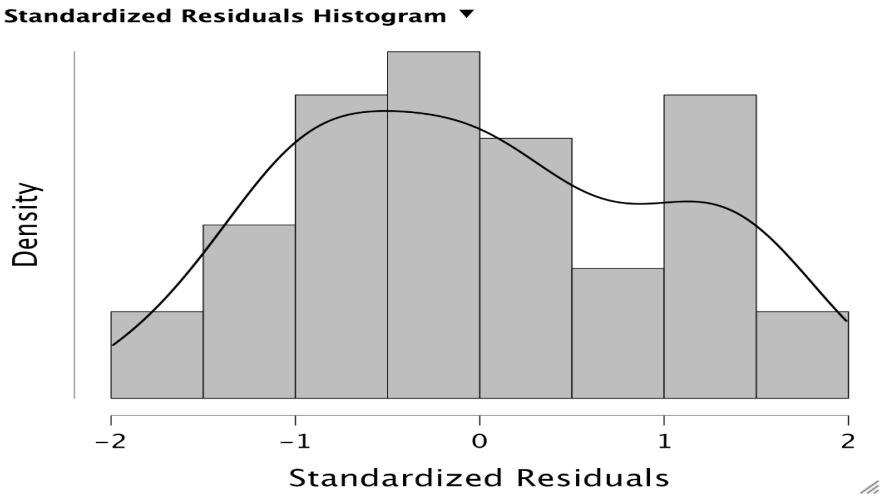
Given the lack of normal distribution of the QTSR data, the linear regression is not significant at the common threshold of 0.05. This effectively represents a non-existent predictive relationship between the sub-category of Support within the QTSR and the EVEQ score, which once again, is not unexpected given the earlier Shapiro-Wilk test findings indicating that the overall QTSR data is not normally distributed.

EVEQ vs Communication

When the EVEQ score is run against the third sub-theme of Communication in the QTSR, the mean of the dependent variable remains the same at 7.051 as does the standard deviation at 4.588 while the mean for the independent variable is measured at 38.103 with the standard deviation at 6.017. The standard residuals are between -1.889 and 1.907 thereby ensuring the absence of outliers as exhibited in Figure 10. The JASP contingency tables of results can be found in Appendix N.

Figure 10

Test for Outliers EVEQ vs Communication



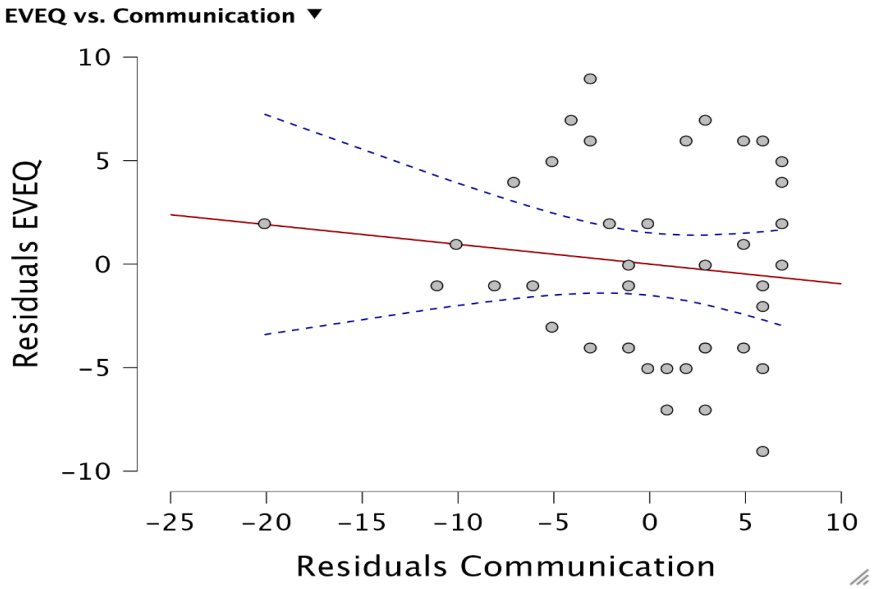
Note. Standardized Residuals Histogram which indicates an absence of outliers in the data.

Results from the ANOVA and Model Summary tables of the Linear Regression which was carried out on the EVEQ score and the Communication sub-category of the QTSR show a correlation coefficient R = 0.125 with a standardized error RMSE = 4.613 and that the independent variable did not significantly predict the EVEQ score with an F-value F(1, 38) =

0.588, p = 0.488. The standardized coefficient of r(38) = -0.125, p = 0.448 with Confidence Intervals 95% CI = -0.347 to 0.157 demonstrates an absence of a statistically significant correlation over the testing period, as depicted in the Partial Regression Plot in Figure 11.

Figure 11

Partial Regression Plot



Note. Plot presenting the relationship between EVEQ score and Communication score.

Given the presence of a non-normal distribution of the QTSR data, the linear regression is not significant at the common threshold of 0.05. This effectively represents a non-existent predictive relationship between the sub-category of Support within the QTSR and the EVEQ score, which yet again, is inevitable given the earlier Shapiro-Wilk test findings indicating that the overall QTSR data is not normally distributed.

Discussion

The idea for this study is grounded in psychological research from Lambert (1992), which highlights the positive influence of the relational dynamic between a qualified specialist and an individual who is engaged in a learning process and therefore has embarked on a journey of new learning and positive change. This idea is inadvertently supported by work from Dulay and Burt (1977), who argue that the emotional and psychological state of students is a critical contributor to L2 language learning outcomes. Krashen (1987) instinctively alludes to probable consequences of this phenomenon with the proposition of the Affect Filter Hypothesis which suggests that second language acquisition is enhanced when students experience lower levels of anxiety and negative affect. The rationale involved in the conception and design of this research project is based on the premise that by consolidating empirical data and theoretical literature from the fields of Applied Psychology and Applied Linguistics, the TSR can be proven to improve SLA in general, and in the case of this study, EVE in particular.

Upon initial completion of the statistical analysis of the results from this study, it is clearly visible that the data did not provide evidence to confirm the alternative hypothesis statements and therefore, the null hypotheses could not be rejected. In effect, the results reveal that there was no statistically significant correlation noted between EVE and the TSR in general, not to mention any predictive relationship, thereby impeding the potential to conclusively respond to the research questions formulated in this paper. Closer scrutiny of the data using the Shapiro-Wilk test (see Appendix K), and visual inspection of the EVEQ vs QTSR Standardized Residuals histogram in Figure 3, uncovers and displays a non-normal distribution of the data. Furthermore, a granular examination of the QTSR scores in the Descriptives Contingency Table (see Appendix K), and a brief glance at the QTSR results (see Appendix G), reveals a mean score of 120, where the maximum possible score is 135, a

standard deviation of 10, and all but one score above 100. This is unequivocally skewed to the positive and effectively demonstrates that the participants scored the TSR very highly regardless of EVE and improved English language proficiency in the classroom.

The positive skew in the TSR data was a potential concern that was considered during the design of the QTSR instrument, as duly noted in the methodology section of this paper, with reference to a potential for a bias towards social desirability, due to the young age profile of the participants in this study. Unfortunately, a viable antidote to this undesirable outcome, with the use of the Effective Smiley Face Likert Scale (Hall et al., 2016), was not possible due to copyright infringement policy, and a lack of a suitable alternative. Hence, the Five Star Likert Scale which was used in lieu of the aforementioned scale may have inadvertently activated a Social Desirability Bias in the young participants' responses to their perception of aspects of the TSR contained in the QTSR questions in this study.

Moreover, the relatively short duration of the intervention period is another plausible contributary factor which may have inadvertently favored an overly positive perception of the TSR from the young student participants participating in the study, due to the Novelty Effect (Jungert et al., 2020). Indeed, students at such a young age tend to exhibit a heightened level of enthusiasm and engagement with new teachers in general, especially over such a short period of time with an enthusiastic trainee teacher who is a native speaker of their target language, thereby possibly exerting an inordinate impact on their QTSR responses in relation to their perceived quality of the TSR.

It is also important to note the meaningful and significant amelioration in EVE demonstrated over the short intervention period despite, or quite possibly because of, the exceedingly positive perceived TSR reported by the study participants. Indeed, the mere observation of this significantly positive learning outcome (as evidenced in Appendix J and Figure 1), combined with the positively skewed QTSR data (see Appendix K and Figure 4),

could be considered to provide valid grounds for further examination in relation to the potential of a positive TSR to exert a beneficial impact on EVE in the classroom.

Limitations and Implications for Future Research

Notwithstanding the data anomaly encountered with the non-normal distribution of the QTSR results, the relatively small sample size of the participants in this study could be viewed as a considerable limitation in relation to the generalizability of any possible findings, thereby pointing to the need for further large-scale studies in this area of investigation. In a similar vein, the culturally homogenous sample, while ensuring an authentic representation of the Catalan experience, could represent potential limitations in relation to the transferability of any possible implications derived from the results. Future research in this area with more diverse cultural samples would be necessary to explore the universality of any observed tendencies.

The QTSR data collection instrument used in the study to evaluate the TSR was inspired by the TSRQ-Q developed by Jowett et al. (2023), and subsequently adapted by this researcher for the purposes of this study. However, due to time constraints it was only possible to pilot test it with three peer Master's students, a national primary school teacher in Tarragona, and a university professor at the URV. Ideally, steps would also be taken to establish various aspects of validity (construct, criterion, predictive, content) with specialists in the field of psychometrics, and the questionnaire would be standardized to ensure consistency and equivalence.

Moreover, and perhaps most importantly, it may be argued that the short duration of the testing period does not provide the adequate time necessary for the formation of a truly representative TSR which could be expected to provide consistent and reliable results in relation to the specific interplay between relational dynamics and second language acquisition. Ideally, future studies in this area will be undertaken over sufficiently longer

periods of time to allow for the formation of a more stable and substantial TSR, which would also serve to mitigate any possible undue impact emanating from the aforementioned Novelty Effect.

A further limitation is the perennial question of student heterogeneity, particularly in relation to linguistic aptitude or intelligence. Despite the paired samples t-test's non-significant normality distribution outcome on the EVEQ results, the TSR may be subject to an undue positive influence by those who are naturally more disposed to language learning than others, thereby representing a confounding variable which could pass under the radar of the study. Future developments and research on this subject would need to consider and control for covariates of this nature.

A final point which merits further attention is that of the administration of age-appropriate Likert scale emojis in questionnaires in an endeavor to mitigate undue influence of the Social Desirability Bias, especially with children. Indeed, this emergent issue is one of several plausible covariates which may have interfered with the TSR results to such a considerable extent as to render the proposed alternative hypotheses unverifiable.

Conclusion

Teaching and learning English as a Foreign or a Second Language in the classroom is essentially a relational process between two individuals. There are as many separate TSRs in the classroom as there are individual students. Each one of these are unique. The process of learning a new language is closely intertwined with that of behavior modification with the support and guidance of a fully qualified and certified specialist. Drawing on scholarly and scientific research from the fields of Applied Psychology and Applied Linguistics, this study

proposed to investigate the influence that interpersonal dynamics between the teacher and the student has on English language learning in the EL2 classroom.

Although the markedly positive skew of the data from the participants' scoring of the quality of the TSR effectively rendered acceptance of the null hypotheses inevitable in this particular study, there are some fundamental takeaways that emerge upon closer scrutiny of the methodology and the data. Any future studies on this topic would be well advised to seriously consider a higher age profile of participants (e.g. minimum 18 years of age) than that used in this inquiry in order to mitigate the potential for data collection anomalies via a Social Desirability Bias. Alternatively, in the case of a similar participant age-profile as that used in this study, the utilization of an Emoji format for Likert style responses, based on the concept of the Effective Smiley Face Likert Scales considered in this paper, merits serious consideration. Indeed, this issue may warrant further investigation in its own right in terms of increased authenticity and congruence in relation to the responses provided by children to Likert style questionnaires of this nature.

Likewise, a longer duration of intervention to offset any possible Novelty Effect and to allow for the development of mature, congruent, and authentic relationships between the teacher and the student participants would be well-advised given the skewed TSR scoring obtained over a short intervention period in this data set. It is proposed that these modifications alone ought to suffice to correct the non-normal distribution of the QTSR data encountered in this study.

Notwithstanding the unanticipated overly positive skew in the QTSR data set, the standalone EVEQ results clearly demonstrate statistically significant and instructionally meaningful improvement in EVE over the relatively brief intervention period, which could in itself reasonably be conjectured to be correlated to a positive TSR, although this would naturally require further investigation and verification.

In the ever changing and continuously evolving world of SLA, the interactional and sociocultural nature of the process of learning to understand and use a new language has been clearly established. Therefore, it is important to continuously strive to learn new ways to understand and leverage the human relational interplay in the service of improved L2 learning outcomes. To that end, despite, and indeed because of, the positively skewed data in this study, further investigation of the interpersonal dynamic of the teacher-student relationship, in the context of TLEL2, is warranted. In particular, it is proposed that by employing the approach and methodology outlined in this paper, including the suggested adjustments to offset any individual or synergistic impact of the aforementioned covariates, subsequent research endeavors will benefit from an enhanced and more nuanced investigation of the influence of the TSR in SLA, thereby providing a greater potential to comprehensively address the research questions and proposed hypotheses contained in this paper.

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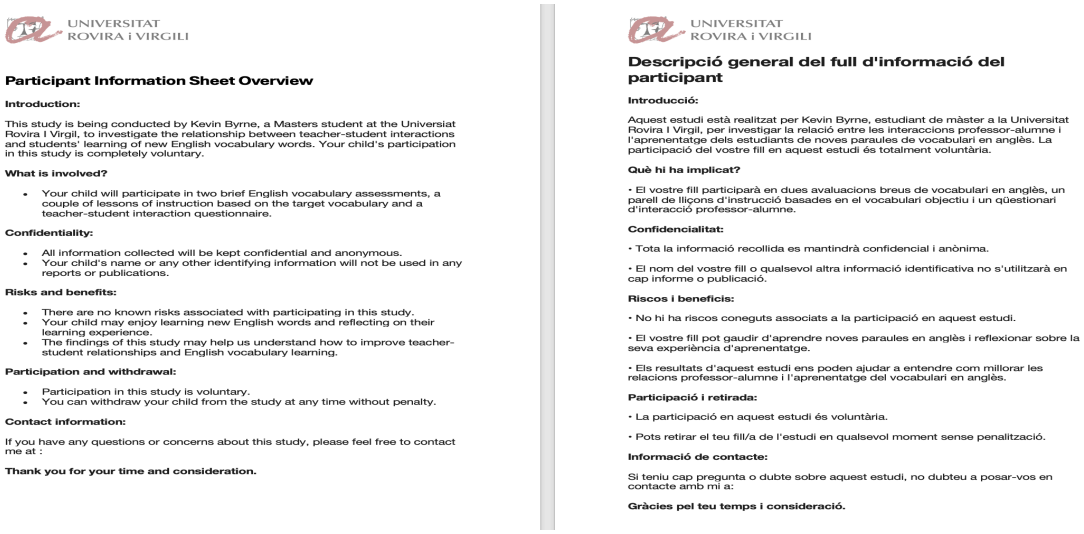
Appendix A

Participant Forms

A-1: Participant Information Overview Sheet

https://rovira-my.sharepoint.com/:w:/g/personal/c28681623_epp_urv_cat/EbCMXaDbfdZMuMCsA1u99uAB571UTDPKnpUQLRTo20c7fg?e=9HJ5sT



UNIVERSITAT ROVIRA i VIRGILI

Participant Information Sheet Overview

Introduction:

This study is being conducted by Kevin Byrne, a Masters student at the Universiat Rovira I Virgil, to investigate the relationship between teacher-student interactions and students' learning of new English vocabulary words. Your child's participation in this study is completely voluntary.

What is involved?

- Your child will participate in two brief English vocabulary assessments, a couple of lessons of instruction based on the target vocabulary and a teacher-student interaction questionnaire.

Confidentiality:

- All information collected will be kept confidential and anonymous.
- Your child's name or any other identifying information will not be used in any reports or publications.

Risks and benefits:

- There are no known risks associated with participating in this study.
- Your child may enjoy learning new English words and reflecting on their learning experience.
- The findings of this study may help us understand how to improve teacher-student relationships and English vocabulary learning.

Participation and withdrawal:

- Participation in this study is voluntary.
- You can withdraw your child from the study at any time without penalty.

Contact information:

If you have any questions or concerns about this study, please feel free to contact me at :

Thank you for your time and consideration.

UNIVERSITAT ROVIRA i VIRGILI

Descripció general del full d'informació del participant

Introducció:

Aquest estudi està realitzat per Kevin Byrne, estudiant de màster a la Universitat Rovira I Virgil, per investigar la relació entre les interaccions professor-alumne i l'aprenentatge dels estudiants de noves paraules de vocabulari en anglès. La participació del vostre fill en aquest estudi és totalment voluntària.

Què hi ha implicat?

• El vostre fill participarà en dues avaluacions breus de vocabulari en anglès, un parell de lliçons d'instrucció basades en el vocabulari objectiu i un qüestionari d'interacció professor-alumne.

Confidencialitat:

• Tota la informació recollida es mantindrà confidencial i anònima.

• El nom del vostre fill o qualsevol altra informació identificativa no s'utilitzarà en cap informe o publicació.

Riscos i beneficis:

• No hi ha riscos coneguts associats a la participació en aquest estudi.

• El vostre fill pot gaudir d'aprendre noves paraules en anglès i reflexionar sobre la seva experiència d'aprenentatge.

• Els resultats d'aquest estudi ens poden ajudar a entendre com millorar les relacions professor-alumne i l'aprenentatge del vocabulari en anglès.

Participació i retirada:

• La participació en aquest estudi és voluntària.

• Pots retirar el teu fill/a de l'estudi en qualsevol moment sense penalització.

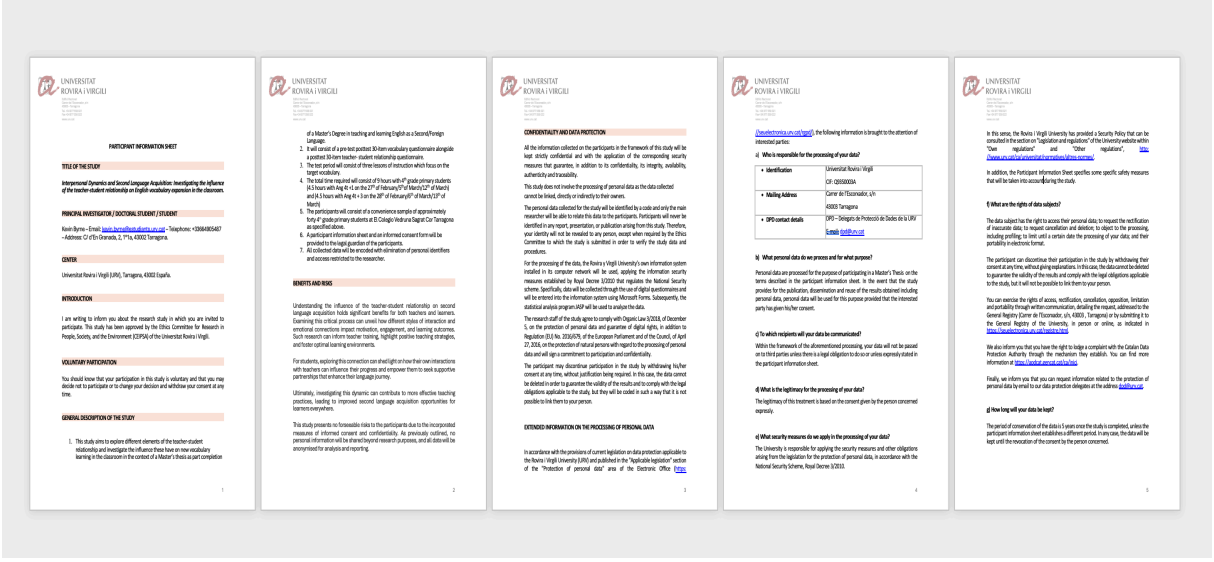
Informació de contacte:

Si teniu cap pregunta o dubte sobre aquest estudi, no dubteu a posar-vos en contacte amb mi a:

Gràcies pel teu temps i consideració.

A-2: Participant Information Sheet

https://rovira-my.sharepoint.com/:w:/g/personal/c28681623_epp_urv_cat/Ef-XnHDcj_FGnLh6pD1wMSABtTogCoiVGBSsa_FPK_yg6Q?e=xVE4tc



UNIVERSITAT ROVIRA i VIRGILI

PARTICIPANT INFORMATION SHEET

TITLE OF THE STUDY

Interpersonal Dynamics and Second Language Acquisition: Investigating the influence of the teacher-student relationship on English vocabulary expansion in the classroom.

PRINCIPAL INVESTIGATOR / DOCTORAL STUDENT / STUDENT

Kevin Byrne – E-mail: kevin.byrne@estudiants.urv.cat – Telephone: +33664085487 – Address: C/ d'En Granada, 2, 1ºla, 43002 Tarragona.

CENTER

Universitat Rovira i Virgili (URV), Tarragona, 43002 España.

INTRODUCTION

I am writing to inform you about the research study in which you are invited to participate. This study has been approved by the Ethics Committee for Research in People, Society, and the Environment (CEPSA) of the Universitat Rovira i Virgili.

VOLUNTARY PARTICIPATION

You should know that your participation in this study is voluntary and that you may decide not to participate or to change your decision and withdraw your consent at any time.

GENERAL DESCRIPTION OF THE STUDY

1. This study aims to explore different elements of the teacher-student relationship and investigate the influence these have on new vocabulary learning in the classroom in the context of a Master's thesis as part completion

of a Master's Degree in teaching and learning English as a Second/Foreign Language.

2. It will consist of a pre-test posttest 30-item vocabulary questionnaire alongside a posttest 30-item teacher- student relationship questionnaire.
3. The test period will consist of three lessons of instruction which focus on the target vocabulary.
4. The total time required will consist of 9 hours with 4th grade primary students (4.5 hours with Aog 4) 1 on the 27th of February/5th of March/12th of March and (4.5 hours with Aog 4) 1 on the 26th of February/6th of March/12th of March)
5. The participants will consist of a convenience sample of approximately forty 4th grade primary students at El Colegio Vedruna Sagrat Cor Tarragona as specified above.
6. A participant information sheet and an informed consent form will be provided to the legal guardian of the participants.
7. All collected data will be encoded with elimination of personal identifiers and access restricted to the researcher.

BENEFITS AND RISKS

Understanding the influence of the teacher-student relationship on second language acquisition holds significant benefits for both teachers and learners. Examining this critical process can unveil how different styles of interaction and emotional connections impact motivation, engagement, and learning outcomes. Such research can inform teacher training, highlight positive teaching strategies, and foster optimal learning environments.

For students, exploring this connection can shed light on how their own interactions with teachers can influence their progress and empower them to seek supportive partnerships that enhance their language journey.

Ultimately, investigating this dynamic can contribute to more effective teaching practices, leading to improved second language acquisition opportunities for learners everywhere.

This study presents no foreseeable risks to the participants due to the incorporated measures of informed consent and confidentiality. As previously outlined, no personal information will be shared beyond research purposes, and all data will be anonymised for analysis and reporting.

CONFIDENTIALITY AND DATA PROTECTION

All the information collected on the participants in the framework of this study will be kept strictly confidential and with the application of the corresponding security measures that guarantee, in addition to its confidentiality, its integrity, availability, authenticity and traceability.

This study does not involve the processing of personal data as the data collected cannot be linked, directly or indirectly to their owners.

The personal data collected for the study will be identified by a code and only the main researcher will be able to relate this data to the participants. Participants will never be identified in any report, presentation, or publication arising from this study. Therefore, your identity will not be revealed to any person, except when required by the Ethics Committee to which the study is submitted in order to verify the study data and procedures.

For the processing of the data, the Rovira y Virgili University's own information system installed in its computer network will be used, applying the information security measures established by Royal Decree 3/2010 that regulates the National Security scheme. Specifically, data will be collected through the use of digital questionnaires and will be entered into the information system using Microsoft Forms. Subsequently, the statistical analysis program JASP will be used to analyze the data.

The research staff of the study agree to comply with Organic Law 3/2018, of December 5, on the protection of personal data and guarantee of digital rights, in addition to Regulation (EU) No. 2016/679, of the European Parliament and of the Council, of April 27, 2016, on the protection of natural persons with regard to the processing of personal data and will sign a commitment to participation and confidentiality.

The participant may discontinue participation in the study by withdrawing his/her consent at any time, without justification being required. In this case, the data cannot be deleted in order to guarantee the validity of the results and to comply with the legal obligations applicable to the study, but they will be coded in such a way that it is not possible to link them to your person.

EXTENDED INFORMATION ON THE PROCESSING OF PERSONAL DATA

In accordance with the provisions of current legislation on data protection applicable to the Rovira i Virgili University (URV) and published in the "Applicable legislation" section of the "Protection of personal data" area of the Electronic Office (https://seuelectronica.urv.cat/tgpd/), the following information is brought to the attention of interested parties:

a) **Who is responsible for the processing of your data?**

• Identification	Universitat Rovira i Virgili CIF: Q5550009A
• Mailing Address	Carrer de l'Escorxador, s/n 43003 Tarragona
• DPD contact details	DPD – Delegats de Protecció de Dades de la URV E-mail: dpd@urv.cat

b) **What personal data do we process and for what purpose?**

Personal data are processed for the purpose of participating in a Master's Thesis on the terms described in the participant information sheet. In the event that the study provides for the publication, dissemination and reuse of the results obtained including personal data, personal data will be used for this purpose provided that the interested party has given his/her consent.

c) **To which recipients will your data be communicated?**

Within the framework of the aforementioned processing, your data will not be passed on to third parties unless there is a legal obligation to do so or unless expressly stated in the participant information sheet.

d) **What is the legitimacy for the processing of your data?**

The legitimacy of this treatment is based on the consent given by the person concerned expressly.

e) **What security measures do we apply in the processing of your data?**

The University is responsible for applying the security measures and other obligations arising from the legislation for the protection of personal data, in accordance with the National Security Scheme, Royal Decree 3/2010.

In this sense, the Rovira i Virgili University has provided a Security Policy that can be consulted in the section on "Legislation and regulations" of the University website within "Own regulations" and "Other regulations", http://www.urv.cat/ca/universitat/normatives/altres-normes/

In addition, the Participant Information Sheet specifies some specific safety measures that will be taken into account during the study.

f) **What are the rights of data subjects?**

The data subject has the right to access their personal data; to request the rectification of inaccurate data; to request cancellation and deletion; to object to the processing, including profiling; to limit until a certain date the processing of your data; and their portability in electronic format.

The participant can discontinue their participation in the study by withdrawing their consent at any time, without giving explanations. In this case, the data cannot be deleted to guarantee the validity of the results and comply with the legal obligations applicable to the study, but it will not be possible to link them to your person.

You can exercise the rights of access, rectification, cancellation, opposition, limitation and portability through written communication, detailing the request, addressed to the General Registry (Carrer de l'Escorxador, s/n, 43003, Tarragona) or by submitting it to the General Registry of the University, in person or online, as indicated in https://seuelectronica.urv.cat/registre.html.

We also inform you that you have the right to lodge a complaint with the Catalan Data Protection Authority through the mechanism they establish. You can find more information at https://apdcat.gencat.cat/ca/inici

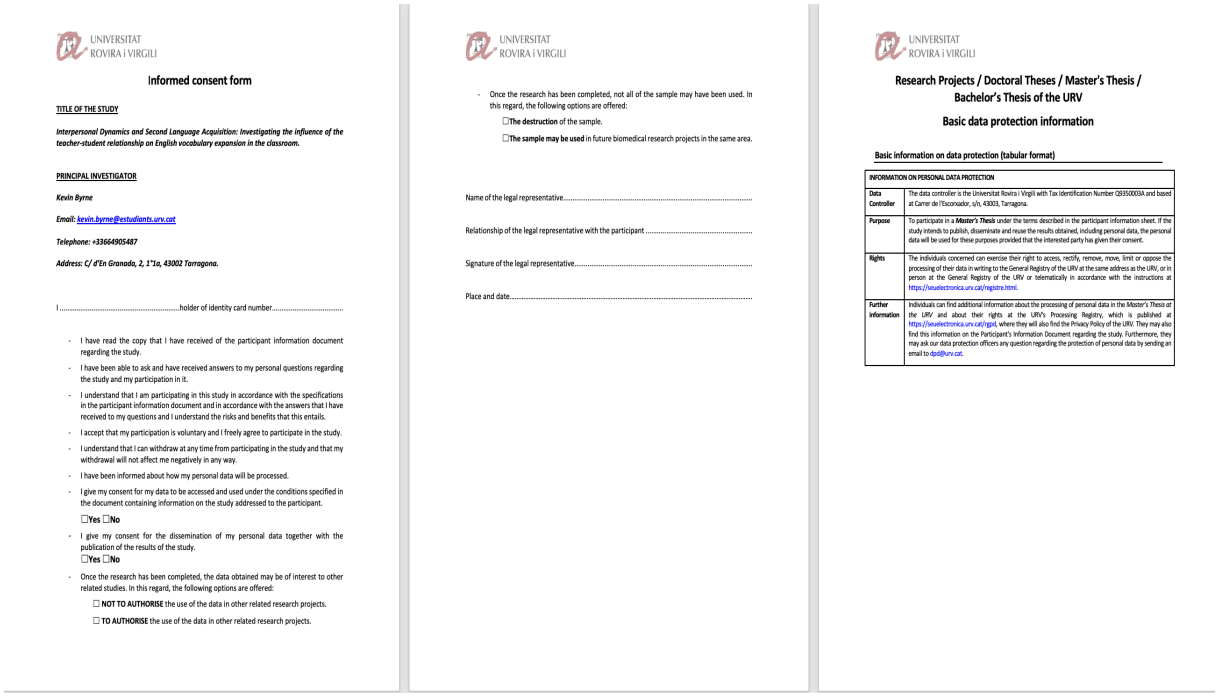
Finally, we inform you that you can request information related to the protection of personal data by email to our data protection delegates at the address dpd@urv.cat.

g) **How long will your data be kept?**

The period of conservation of the data is 5 years once the study is completed, unless the participant information sheet establishes a different period. In any case, the data will be kept until the revocation of the consent by the person concerned.

A-3: Participant Informed Consent Form

https://rovira-my.sharepoint.com/:w:/g/personal/c28681623_epp_urv_cat/EdAsNtrbFgJPuISXhVJO6L0BTUsfFWmVNFcH07vVrMyPWA?e=Ls5tnf



UNIVERSITAT ROVIRA i VIRGILI

Informed consent form

TITLE OF THE STUDY

Interpersonal Dynamics and Second Language Acquisition: Investigating the influence of the teacher-student relationship on English vocabulary expansion in the classroom.

PRINCIPAL INVESTIGATOR

Kevin Byrne

Email: kevin.byrne@estudiants.urv.cat

Telephone: +33664905487

Address: C/ d'En Granada, 2, 1°1a, 43002 Tarragona.

I.....holder of identity card number.....

- I have read the copy that I have received of the participant information document regarding the study.
- I have been able to ask and have received answers to my personal questions regarding the study and my participation in it.
- I understand that I am participating in this study in accordance with the specifications in the participant information document and in accordance with the answers that I have received to my questions and I understand the risks and benefits that this entails.
- I accept that my participation is voluntary and I freely agree to participate in the study.
- I understand that I can withdraw at any time from participating in the study and that my withdrawal will not affect me negatively in any way.
- I have been informed about how my personal data will be processed.
- I give my consent for my data to be accessed and used under the conditions specified in the document containing information on the study addressed to the participant.

  ☐**Yes** ☐**No**
- I give my consent for the dissemination of my personal data together with the publication of the results of the study.

  ☐**Yes** ☐**No**
- Once the research has been completed, the data obtained may be of interest to other related studies. In this regard, the following options are offered:

  ☐ **NOT TO AUTHORISE** the use of the data in other related research projects.

  ☐ **TO AUTHORISE** the use of the data in other related research projects.

UNIVERSITAT ROVIRA i VIRGILI

- Once the research has been completed, not all of the sample may have been used. In this regard, the following options are offered:

  ☐**The destruction** of the sample.

  ☐**The sample may be used** in future biomedical research projects in the same area.

Name of the legal representative.....

Relationship of the legal representative with the participant .....

Signature of the legal representative.....

Place and date.....

UNIVERSITAT ROVIRA i VIRGILI

Research Projects / Doctoral Theses / Master's Thesis / Bachelor's Thesis of the URV

Basic data protection information

Basic information on data protection (tabular format)

INFORMATION ON PERSONAL DATA PROTECTION	
Data Controller	The data controller is the Universitat Rovira i Virgili with Tax Identification Number Q3350003A and based at Carrer de l'Escorxador, s/n, 43003, Tarragona.
Purpose	To participate in a ***Master's Thesis*** under the terms described in the participant information sheet. If the study intends to publish, disseminate and reuse the results obtained, including personal data, the personal data will be used for these purposes provided that the interested party has given their consent.
Rights	The individuals concerned can exercise their right to access, rectify, remove, move, limit or oppose the processing of their data in writing to the General Registry of the URV at the same address as the URV, or in person at the General Registry of the URV or telematically in accordance with the instructions at https://seuelectronica.urv.cat/registre.html.
Further information	Individuals can find additional information about the processing of personal data in the Master's Thesis at the URV and about their rights at the URV's Processing Registry, which is published at https://seuelectronica.urv.cat/rgpd, where they will also find the Privacy Policy of the URV. They may also find this information on the Participant's Information Document regarding the study. Furthermore, they may ask our data protection officers any question regarding the protection of personal data by sending an email to dpd@urv.cat.

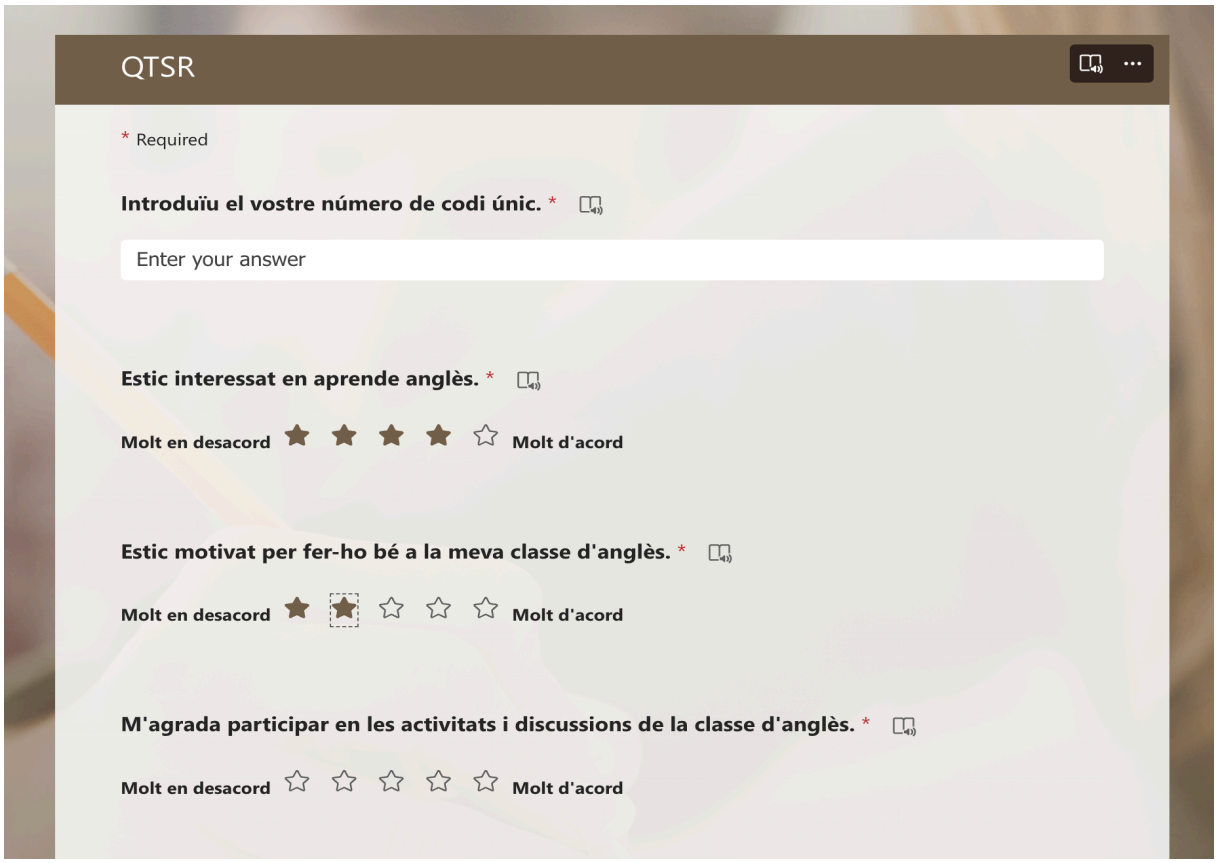
Appendix B

Likert Scale format options

B-1: Effective Smiley Face Likert Scales as suggested by Hall et al. (2016)

Figure 8: The 5 Degrees of Happiness SFL

B-2: Example of Five-star Likert Scale as proposed by Microsoft Forms (and used in the QTSR questionnaire for this study)



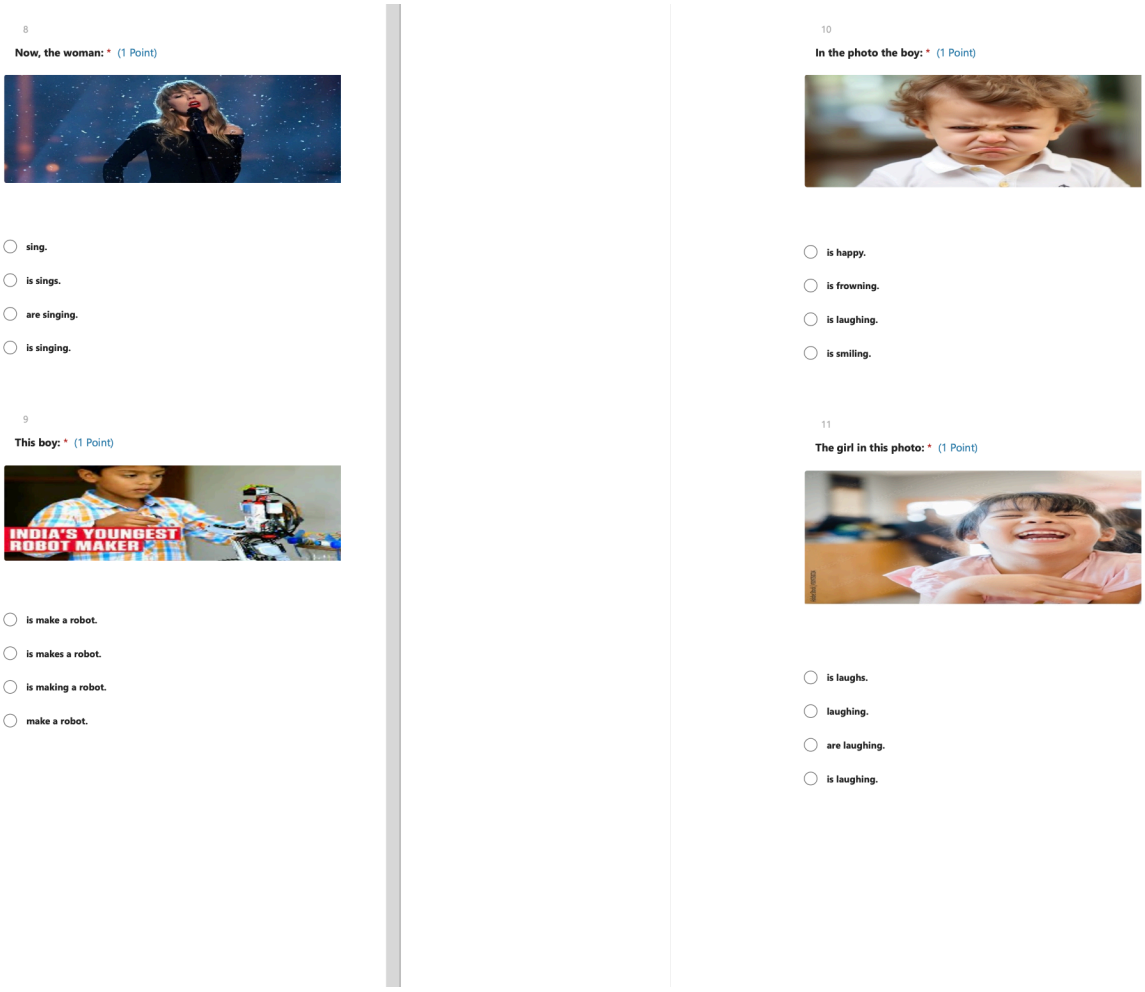
Appendix C

Microsoft Forms EVE Questionnaire (EVEQ)

C-1: Link to EVEQ on Microsoft Forms

https ://forms.office.com/Pages/ResponsePage.aspx ?id=aykR84I-TkyCqajkA6QrEcGjQpcuQbtNoef549ZpPJpUNUk5UkVHVzJPNllMNjZZOTJIVVZaTFQxWi4u

C-2: Visual sample of EVEQ questions



Appendix D

Microsoft Forms Teacher-student Relationship Questionnaire (QTSR)

B-1: Link to QTSR on Microsoft Forms

https://forms.office.com/Pages/ResponsePage.aspx?id=aykR84I-TkyCqajkA6QrEcGjQpcuQbtNoef549ZpPJpUNDE0REpJSUFESk9ZVlg0N1ZENURUREx XMC4u

B-2: Visual sample of QTSR Questions

1. **Introduïu el vostre número de codi únic.** *

   Enter your answer

2. **Estic interessat en aprende anglès.** *

   Molt en desacord ☆ ☆ ☆ ☆ ☆ **Molt d'acord**

3. **Estic motivat per fer-ho bé a la meva classe d'anglès.** *

   Molt en desacord ☆ ☆ ☆ ☆ ☆ **Molt d'acord**

4. **M'agrada participar en les activitats i discussions de la classe d'anglès.** *

   Molt en desacord ☆ ☆ ☆ ☆ ☆ **Molt d'acord**

5. **Sento que estic progressant en la meva classe d'anglès.** *

   Molt en desacord ☆ ☆ ☆ ☆ ☆ **Molt d'acord**

6. **M'agradaria continuar estudiant anglès en el futur.** *

   Molt en desacord ☆ ☆ ☆ ☆ ☆ **Molt d'acord**

7. **El meu professor m'ajuda a treballar bé.** *

   Molt en desacord ☆ ☆ ☆ ☆ ☆ **Molt d'acord**

8. **El meu professor és pacient i comprensiu quan cometo errors.** *

   Molt en desacord ☆ ☆ ☆ ☆ ☆ **Molt d'acord**

Appendix E

Pilot test Questionnaire for QTSR and EVEQ

Please rate each of the questions numbered 1-10 in the QTSR and the EVEQ using the following Likert Scale from 1-5 where:
1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Question	I understood what this question was saying	This question is not ambiguous	This question is logical and will help the researcher	I believe this question should be included in the questionnaire
1)				
2)				
3)				
4)				
5)				
6)				
7)				
8)				
9)				
10)				
11)				
12)				
13)				
14)				
15)				
16)				
17)				
18)				
19)				
20)				
21)				
22)				
23)				
24)				
25)				
26)				
27)				
28)				
29)				
30)				

Appendix F

EVEQ Score (csv table of raw results)

EVEQ Score

Student	Pre-test	Posttest	EVEQ
Y8	11	27	16
X4	10	24	14
X9	14	28	14
X14	15	28	13
X2	15	28	13
Y4	15	28	13
Y9	13	26	13
G210	7	19	12
G26	6	18	12
X19	11	22	11
Y7	11	22	11
G27	13	22	9
Y1	15	26	9
Y18	11	20	9
Y6	20	29	9
G25	9	17	8
Y12	11	19	8
G21	18	25	7
G24	20	27	7
X10	20	27	7
G29	17	23	6
X1	15	21	6
X8	11	17	6
Y11	23	29	6
Y2	11	17	6
Y13	20	25	5
X12	14	18	4
G215	17	20	3
G216	20	23	3
X17	18	21	3
X18	7	10	3
Y15	25	28	3
G22	13	15	2
X11	24	26	2
X5	10	12	2
Y3	24	26	2
Y10	25	25	0
Y14	13	13	0
Y5	25	23	-2

Appendix G

QTSR Score (csv table of raw results)

QTSR Score

Student	QTSR
G210	135
X19	135
Y1	134
G215	133
X10	133
Y4	133
X14	131
G21	130
Y5	130
G22	129
Y13	129
Y15	129
Y10	128
Y12	128
Y2	128
G216	123
X5	123
G24	122
G27	120
X2	120
X4	119
X18	118
Y14	118
Y3	118
X17	117
X11	116
G29	115
X8	115
X12	114
Y9	114
X9	113
Y7	113
Y8	110
G26	109
X1	107
Y11	107
Y18	107
G25	100
Y6	86

Appendix H

QTSR Score and subcategories of Collaboration, Support & Communication (csv table of raw results)

QTSR & Themes

Student	QTSR	Collaboration	Support	Communication
G210	135	45	44	41
X19	135	45	45	45
Y1	134	45	45	43
G215	133	41	45	37
X10	133	42	43	44
Y4	133	43	42	37
X14	131	36	36	28
G21	130	35	41	33
Y5	130	39	43	38
G22	129	39	44	32
Y13	129	36	44	27
Y15	129	43	45	45
Y10	128	36	42	38
Y12	128	39	42	33
Y2	128	42	45	44
G216	123	40	42	35
X5	123	37	40	41
G24	122	45	45	45
G27	120	40	45	35
X2	120	35	43	41
X4	119	39	44	40
X18	118	34	44	37
Y14	118	39	40	34
Y3	118	44	45	45
X17	117	44	45	39
X11	116	37	40	30
G29	115	42	43	43
X8	115	40	45	44
X12	114	37	40	41
Y9	114	43	45	41
X9	113	27	44	36
Y7	113	39	45	44
Y8	110	36	43	39
G26	109	45	45	43
X1	107	42	44	44
Y11	107	38	30	18
Y18	107	38	44	31
G25	100	35	40	35
Y6	86	29	45	40

Appendix I

EVEQ Score vs QTSR Score & subcategories (csv table of raw results)

EVEQ-QTSR

Student	Pre-test	Posttest	EVEQ	QTSR	Collaboration	Support	Communication
Y8	11	27	16	110	35	40	35
X4	10	24	14	119	35	43	41
X9	14	28	14	113	39	40	34
X14	15	28	13	131	42	45	44
X2	15	28	13	120	40	45	35
Y4	15	28	13	133	45	45	43
Y9	13	26	13	114	29	45	40
G210	7	19	12	135	45	45	45
G26	6	18	12	109	35	41	33
X19	11	22	11	135	45	45	45
Y7	11	22	11	113	38	44	31
G27	13	22	9	120	39	43	38
Y1	15	26	9	134	44	45	45
Y18	11	20	9	107	27	44	36
Y6	20	29	9	86	38	30	18
G25	9	17	8	100	36	36	28
Y12	11	19	8	128	42	43	43
G21	18	25	7	130	45	44	41
G24	20	27	7	122	43	42	37
X10	20	27	7	133	43	45	45
G29	17	23	6	115	39	44	32
X1	15	21	6	107	36	44	27
X8	11	17	6	115	34	44	37
Y11	23	29	6	107	37	40	30
Y2	11	17	6	128	39	45	44
Y13	20	25	5	129	40	45	44
X12	14	18	4	114	39	42	33
G215	17	20	3	133	45	45	43
G216	20	23	3	123	41	45	37
X17	18	21	3	117	40	42	35
X18	7	10	3	118	37	40	41
Y15	25	28	3	129	43	45	41
G22	13	15	2	129	42	43	44
X11	24	26	2	116	36	42	38
X5	10	12	2	123	39	44	40
Y3	24	26	2	118	36	43	39
Y10	25	25	0	128	44	45	39
Y14	13	13	0	118	37	40	41
Y5	25	23	-2	130	42	44	44

Appendix J

EVEQ Contingency Tables of Results from JASP Analysis

Paired Samples T-Test ▼

Paired Samples T-Test

								95% CI for Cohen's d	
Measure 1		Measure 2	t	df	p	Cohen's d	SE Cohen's d	Lower	Upper
Pre-test	-	Posttest	−9.598	38	< .001	−1.537	0.210	−1.998	−1.066

Note. Student's t-test.

Assumption Checks ▼

Test of Normality (Shapiro-Wilk) ▼

			W	p
Pre-test	-	Posttest	0.964	0.235

Note. Significant results suggest a deviation from normality.

Descriptives

Descriptives

	N	Mean	SD	SE	Coefficient of variation
Pre-test	39	15.308	5.376	0.861	0.351
Posttest	39	22.410	5.009	0.802	0.224

Appendix K

EVEQ vs QTSR Contingency Tables of Results from JASP Analysis

Linear Regression

Model Summary - EVEQ

Model	R	R^2	Adjusted R^2	RMSE
H_0	0.000	0.000	0.000	4.588
H_1	0.147	0.022	−0.005	4.599

ANOVA

Model		Sum of Squares	df	Mean Square	F	p
H_1	Regression	17.343	1	17.343	0.820	0.371
	Residual	782.554	37	21.150		
	Total	799.897	38			

Note. The intercept model is omitted, as no meaningful information can be shown.

Coefficients

							95% CI	
Model		Unstandardized	Standard Error	Standardized	t	p	Lower	Upper
H_0	(Intercept)	7.051	0.735		9.598	< .001	5.564	8.539
H_1	(Intercept)	14.540	8.302		1.751	0.088	−2.282	31.361
	QTSR	−0.062	0.069	−0.147	−0.906	0.371	−0.202	0.077

Descriptives

	N	Mean	SD	SE
EVEQ	39	7.051	4.588	0.735
QTSR	39	120.231	10.847	1.737

Residuals Statistics

	Minimum	Maximum	Mean	SD	N
Predicted Value	6.131	9.183	7.051	0.676	39
Residual	−8.443	8.312	3.644×10^{-16}	4.538	39
Std. Predicted Value	−1.362	3.156	2.989×10^{-16}	1.000	39
Std. Residual	−1.881	1.853	0.002	1.008	39

Descriptive Statistics

Descriptive Statistics

	EVEQ	QTSR
Valid	39	39
Missing	0	0
Mean	7.051	120.231
Std. Deviation	4.588	10.847
Shapiro-Wilk	0.966	0.935
P-value of Shapiro-Wilk	0.275	0.025
Minimum	−2.000	86.000
Maximum	16.000	135.000

Appendix L

EVEQ vs Collaboration Contingency Tables of Results from JASP Analysis

Linear Regression ▼

Model Summary - EVEQ

Model	R	R^2	Adjusted R^2	RMSE
H_0	0.000	0.000	0.000	4.588
H_1	0.161	0.026	−0.000	4.589

ANOVA

Model		Sum of Squares	df	Mean Square	F	p
H_1	Regression	20.838	1	20.838	0.990	0.326
	Residual	779.059	37	21.056		
	Total	799.897	38			

Note. The intercept model is omitted, as no meaningful information can be shown.

Coefficients ▼

							95% CI	
Model		Unstandardized	Standard Error	Standardized	t	p	Lower	Upper
H_0	(Intercept)	7.051	0.735		9.598	< .001	5.564	8.539
H_1	(Intercept)	13.896	6.919		2.008	0.052	−0.124	27.916
	Collaboration	−0.174	0.175	−0.161	−0.995	0.326	−0.529	0.181

Descriptives

	N	Mean	SD	SE
EVEQ	39	7.051	4.588	0.735
Collaboration	39	39.256	4.247	0.680

Residuals Statistics

	Minimum	Maximum	Mean	SD	N
Predicted Value	6.050	9.188	7.051	0.741	39
Residual	−8.573	8.207	-9.565×10^{-16}	4.528	39
Std. Predicted Value	−1.352	2.886	1.139×10^{-17}	1.000	39
Std. Residual	−1.903	1.837	0.004	1.011	39

Appendix M

EVEQ vs Support Contingency Tables of Results from JASP Analysis

Linear Regression ▼

Model Summary - EVEQ

Model	R	R^2	Adjusted R^2	RMSE
H_0	0.000	0.000	0.000	4.588
H_1	0.054	0.003	−0.024	4.643

ANOVA

Model		Sum of Squares	df	Mean Square	F	p
H_1	Regression	2.302	1	2.302	0.107	0.746
	Residual	797.595	37	21.557		
	Total	799.897	38			

Note. The intercept model is omitted, as no meaningful information can be shown.

Coefficients ▼

							95% CI	
Model		Unstandardized	Standard Error	Standardized	t	p	Lower	Upper
H_0	(Intercept)	7.051	0.735		9.598	< .001	5.564	8.539
H_1	(Intercept)	10.609	10.911		0.972	0.337	−11.499	32.716
	Support	−0.083	0.254	−0.054	−0.327	0.746	−0.597	0.431

Descriptives

	N	Mean	SD	SE
EVEQ	39	7.051	4.588	0.735
Support	39	42.872	2.966	0.475

Residuals Statistics

	Minimum	Maximum	Mean	SD	N
Predicted Value	6.875	8.119	7.051	0.246	39
Residual	−8.958	8.710	6.377×10^{-16}	4.581	39
Std. Predicted Value	−0.717	4.339	2.434×10^{-16}	1.000	39
Std. Residual	−1.958	1.925	0.003	1.006	39

Appendix N

EVEQ vs Communication Contingency Tables of Results from JASP Analysis

Linear Regression ▼

Model Summary - EVEQ ▼

Model	R	R^2	Adjusted R^2	RMSE
H_0	0.000	0.000	0.000	4.588
H_1	0.125	0.016	−0.011	4.613

ANOVA

Model		Sum of Squares	df	Mean Square	F	p
H_1	Regression	12.514	1	12.514	0.588	0.448
	Residual	787.383	37	21.281		
	Total	799.897	38			

Note. The intercept model is omitted, as no meaningful information can be shown.

Coefficients

							95% CI	
Model		Unstandardized	Standard Error	Standardized	t	p	Lower	Upper
H_0	(Intercept)	7.051	0.735		9.598	< .001	5.564	8.539
H_1	(Intercept)	10.686	4.796		2.228	0.032	0.967	20.404
	Communication	−0.095	0.124	−0.125	−0.767	0.448	−0.347	0.157

Descriptives

	N	Mean	SD	SE
EVEQ	39	7.051	4.588	0.735
Communication	39	38.103	6.017	0.963

Residuals Statistics

	Minimum	Maximum	Mean	SD	N
Predicted Value	6.393	8.969	7.051	0.574	39
Residual	−8.489	8.653	4.555×10^{-17}	4.552	39
Std. Predicted Value	−1.146	3.341	7.345×10^{-16}	1.000	39
Std. Residual	−1.889	1.907	7.330×10^{-4}	1.007	39

Appendix O

Slideshow of Lesson delivered during the Intervention Period

O-1: Link to Lesson Presentation used during the intervention period on Google Slides

https://docs.google.com/presentation/d/1KaYfRDXak58VzXfxS8jU4Jk1H_xgndkkwmEErzxZ_7g/edit?usp=sharing

O-2: Visual sample of Lesson Presentation used during the intervention period