

Interactive Video and Oral Comprehension in French for Specific Purposes: Effects of Feedback and Interactivity Types

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Abstract:

This study investigates the impact of interactive video on oral comprehension in economic French (FSP). One hundred intermediate learners were assigned to four groups crossing feedback type and interactivity timing. Conducted via Moodle with H5P modules, the experiment included two identical comprehension tests and a perception questionnaire. Elaborated feedback improves initial performance. While interactivity shows no main effect, it interacts with feedback: delayed interactivity enhances elaborated feedback, and integrated interactivity offsets simple feedback. Perceived cognitive load negatively correlates with initial scores, suggesting that mental effort may hinder immediate comprehension and modulate the effectiveness of instructional design.

Keywords: FSP, oral comprehension, interactive video, feedback, cognitive load

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1. INTRODUCTION

Oral comprehension in a foreign language (L2) is a cognitively demanding skill that requires real-time coordination of phonological decoding, lexical recognition, syntactic parsing, semantic inference, and working memory maintenance (Field, 2008; Vandergrift & Goh, 2012). These processes become even more complex when learners face continuous, rapid, low-redundancy speech embedded with cultural implicitness.

In exolingual university contexts—especially in French for Specific Purposes (FSP)—these challenges are intensified by dense content and specialized vocabulary (Cuq & Gruca, 2003). In economic French, learners often come from disciplinary fields such as economics and must process oral discourse that is simultaneously technical, argumentative, and pragmatic, without the benefit of linguistic immersion (Candelier, 2003; Mangiante & Parpette, 2004). Real-time comprehension thus becomes essential to their academic and professional autonomy.

These demands place considerable strain on working memory, a system responsible for temporarily storing and manipulating information during complex tasks (Baddeley & Hitch, 1974; Baddeley, 2000). Its limited capacity and duration make learners vulnerable to cognitive overload, especially when content is novel, dense, and presented linearly without visual support or feedback.

To mitigate these constraints, audiovisual materials offer promising pedagogical support. Dual coding theory (Paivio, 1971) posits that learning improves when information is processed through both verbal and imagery systems. This redundancy enhances retention and retrieval, particularly under conditions of overload or linguistic uncertainty.

Expanding on this, Mayer (2005) proposes a multimedia learning framework that integrates dual coding and working memory models. He distinguishes three types of memory—sensory, working,

and long-term—and emphasizes the importance of guiding learners from fleeting sensory input to durable mental representations. In L2 oral comprehension, this means designing materials that help filter auditory input, sustain attention, and support schema construction.

Effective multimedia design, however, requires more than adding visuals. Mayer's principles—segmentation, coherence, redundancy, and modality—have been empirically validated across domains, including language learning (Moreno & Brünken, 2010). These principles highlight the need to orchestrate multimodal elements in ways that optimize cognitive processing rather than overwhelm it.

Cognitive load theory (Sweller, 1988; Paas & van Merriënboer, 1994; Paas, van Merriënboer & Kalyuga, 2011) reinforces this view by distinguishing intrinsic, extraneous, and germane load. In L2 oral tasks, rapid speech, unfamiliar vocabulary, and lack of support can saturate working memory (Roussel, 2021). Interactive and multimodal elements may help regulate this load, but only if they are pedagogically calibrated (Tellier & Kasazian, 2021). Poorly designed resources may induce overload, while overly sparse ones may fail to activate relevant cognitive processes.

To move from enrichment to optimization, instructional design must consider learners' attentional and memory constraints (Sweller, Ayres & Kalyuga, 2011). Interactive video offers such potential by embedding guided pauses, questions, and feedback to modulate processing pace and promote active engagement. When aligned with explicit pedagogical goals, interactivity can enhance meaning-making (Saito & Akiyama, 2018).

Yet, interactivity alone is insufficient without structured feedback. Pedagogical feedback—when explicit, contextualized, and process-oriented—supports metacognitive regulation and strategic resource mobilization (Butler & Winne, 1995; Hattie & Timperley, 2007). Narciss's Interactive Tutoring Feedback Model (2008)

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highlights the cognitive, motivational, and regulatory functions of feedback, distinguishing minimalist from elaborated forms. The latter, which includes explanations and hints, fosters retention and autonomy, especially in digital environments. These effects are confirmed by Shute (2008), who emphasizes the value of elaborated feedback in complex learning tasks.

Despite extensive research on audiovisual materials, interactivity, and feedback, no study has systematically examined their combined effects in specialized oral reception tasks. In economic French, where learners must process dense, non-redundant discourse, resource calibration becomes critical. This study therefore investigates how interactive video and elaborated feedback can jointly optimize oral comprehension in exolingual university contexts.

2. RESEARCH OBJECTIVES AND HYPOTHESES

Previous studies have identified several pedagogical levers likely to enhance oral comprehension in foreign languages within digital environments: content segmentation, guided interactivity, and explicit feedback. They also emphasize that the effectiveness of such instructional designs depends on their temporal integration and cognitive coherence.

Building on this foundation, the present study aims to evaluate the combined effect of two variables within a guided oral reception setup in economic French: the type of interactivity (integrated during viewing vs. delayed after viewing) and the type of feedback (simple vs. elaborated). Three hypotheses are formulated:

- **H1:** Participants receiving elaborated feedback will achieve higher oral comprehension scores than those receiving simple feedback.

- **H2:** Participants exposed to integrated interactivity will achieve higher oral comprehension scores than those exposed to delayed interactivity.

- **H3:** An interaction is expected between interactivity type and

feedback type: the effect of elaborated feedback will be more pronounced under integrated interactivity conditions.

3. METHOD

3.1 Experimental Protocol: Overview

The study is based on a mixed factorial design involving two between-subjects factors and one within-subject factor. The between-subjects factors are interactivity type (questions embedded during viewing vs. grouped at the end) and feedback type (simple vs. elaborated), crossed in a 2×2 design. The within-subject factor corresponds to test timing: each participant completes the same comprehension questions at two distinct moments (immediate test and delayed test). This design allows for the examination of main effects for each factor, as well as their interactions, on comprehension performance and audiovisual content retention.

3.2 Participants

The sample consists of 100¹ first-year Master's students enrolled in the Department of Economics at the University of Batna 1. Recruitment was voluntary, following informed consent and a briefing on the study's objectives and procedures. This recruitment method, common in university settings, enables the formation of a targeted and available sample. The sample includes 77 women and 23 men. The dominant age group is 18–24 years (94%), followed by 5% aged 25–30, and one participant aged 36–40.

Participants were randomly assigned to four experimental groups according to a 2×2 factorial design crossing the two independent variables of this study: interactivity type (integrated during viewing vs. delayed at the end of the video) and feedback type (simple vs. elaborated). The distribution is detailed in Table 1.

¹ It should be noted that not all participants completed every part of the experiment. Some did not take Test 1, others missed Test 2, and a few did not respond to the distractor questionnaire. These absences, due to technical or personal constraints, account for the variations in sample sizes reported in the results section.

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Table 1. Participant Distribution by Experimental Conditions (2×2 Factorial Design)

Interactivity Type	Simple Feedback	Elaborated Feedback	Total
Questions during viewing	26 (Group 2)	22 (Group 1)	48
Questions after the video	25 (Group 4)	27 (Group 3)	52
Total	51	49	100

Self-reported French proficiency data were available for 80 participants. Regarding oral skills, 47.5% rated themselves at an intermediate level, 27.5% at a low level, 17.5% at a good level, and 7.5% at a very low level. For written skills, 43.8% reported an intermediate level, 28.7% a good level, 21.3% a low level, 3.8% a very low level, and 2.5% an excellent level.

3.3 Materials

The study relies on four main components integrated into a dedicated Moodle space: an authentic French-language video, an interactive comprehension test, a distractor questionnaire (Google Form), and a delayed second test (Moodle Quiz activity).

1) Video

The video used in this study is an excerpt from the news program *JTNT – Le Journal des nouvelles technos*, broadcast on TV5MONDE and available on the educational platform *TV5MONDE Enseigner*. Lasting 3 minutes and 24 seconds, it introduces the concept of crowdfunding through an informative report and an interview with Vincent Ricordeau, founder of KissKissBankBank. The content covers major crowdfunding platforms, how they operate, the types of projects involved, and contributors' motivations (see transcript in Appendix I). This resource engages oral comprehension and critical analysis skills in an accessible register.

2) Comprehension Test

The comprehension test consists of ten multiple-choice

questions. Each item assesses participants' ability to identify explicit information, interpret implicit elements, and demonstrate global understanding of the audiovisual discourse. The questions address lexical aspects (e.g., identifying the term "crowdfunding" in its English usage), factual details (e.g., recognizing the platform that funded the Oculus Rift), and interpretive dimensions (e.g., analyzing funders' motivations or the emotional logic promoted by KissKissBankBank). Each item offers four options, with only one correct answer (see full question set in Appendix II).

The timing of the ten comprehension questions during the video was designed to distribute cognitive demands evenly throughout the viewing experience (for Groups G1 and G2). Each question appears at a specific moment, directly linked to the audiovisual content, to activate comprehension processes without excessively interrupting the narrative flow.

3) Feedback

The comprehension test includes an immediate feedback mechanism designed to support participants throughout the activity. Two types of feedback were implemented: simple feedback, limited to "Correct" or "Incorrect," and elaborated feedback, described in detail here. The latter varies depending on the participant's response (see full feedback set in Appendix II).

When a correct answer is selected, a positive message is displayed, confirming the choice and providing additional clarification or information. For example, for the question on the term "crowdfunding," the message reads: *"Well done! The term 'crowdfunding' refers to participatory financing in English and is especially used by startups due to their specific funding needs."* This concise and informative formulation aims to reinforce understanding without disrupting the test flow. In the case of an incorrect answer, the feedback takes the form of a guided hint, delivered in a neutral and supportive tone. It does not reveal the correct answer but invites the

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participant to reconsider their choice based on key elements of the audiovisual content.

Message length is deliberately moderate—one to two sentences—to preserve test fluidity. The tone remains pedagogical, free of technical jargon, and consistently encouraging, whether reinforcing success or guiding error correction. This feedback approach supports participant focus while fostering a reflective stance toward the content.

4) Questionnaire

A second questionnaire, administered immediately after the comprehension test, served as a distractor task and collected sociodemographic data and participant perceptions of the experimental setup. It included closed questions on gender, age, education, academic specialization, and self-assessed proficiency in oral and written French. Additional items addressed perceived cognitive effort and aspects of the viewing experience. However, only sociodemographic data, self-assessed comprehension levels, and responses related to cognitive load were analyzed in this study (see Appendix III).

3.4 Experimental Procedure

The experiment was conducted online via a dedicated Moodle space during the final week of April 2025. Participants were pre-registered and received a link granting access to the platform. Upon logging in, they were greeted by an introductory message in Arabic, the language used for all instructions to ensure optimal understanding of the procedure. This message outlined the four successive stages of the experiment:

1. **Selection of Experimental Group:** Participants selected one of the four proposed groups (1, 2, 3, or 4), with a prompt to maintain numerical balance across groups.
2. **Initial Comprehension Test:** The interactive video was embedded within an H5P module on Moodle. This module

included an interactive quiz, in which comprehension questions appeared either progressively during viewing (Groups 1 and 2) or collectively at the end (Groups 3 and 4), depending on the experimental condition.

3. **Distractor Questionnaire:** Immediately after the first test, participants completed a Google Form integrated into Moodle. This 10–15-minute activity, followed by a waiting period of similar duration, created a controlled 30-minute interval between the two test administrations, allowing for the assessment of delayed feedback effects without direct interference from the initial comprehension task.
4. **Delayed Comprehension Test:** Finally, participants answered the same comprehension questions a second time, this time via Moodle's Test activity and without access to the video. This stage aimed to measure the delayed effect of the feedback received during the first test.

Participation was entirely autonomous, guided by instructions written in Arabic and displayed at each stage within the Moodle space. These instructions emphasized the prohibition against rewatching the video, the importance of completing all phases to validate participation, and the need to avoid external assistance. The welcome message stressed that the goal was not to achieve a perfect score, but to reflect the participant's actual level of oral comprehension in French.

3.5 Statistical Analyses

Data were analyzed using SPSS software (version 25), with the significance threshold set at $p < .05$. Participants' performance was evaluated based on scores obtained in the two oral comprehension tests, which served as the primary dependent variables. The analysis plan was based on a mixed-design analysis of variance (repeated-measures ANOVA), combining one within-subject factor: score progression between the two tests, and two between-subjects factors:

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feedback type (simple vs. elaborated) and interactivity type (integrated vs. delayed).

Complementary analyses were conducted to: (i) examine the specific effects of each variable on performance in each test, (ii) verify group homogeneity prior to the experimental manipulation (perceived French proficiency, familiarity with the video topic), and (iii) explore the relationship between perceived cognitive load and observed performance.

4. RESULTS

This section presents the results of the statistical analyses conducted in the study. It begins with preliminary analyses aimed at verifying group homogeneity prior to the implementation of the experimental manipulation. It then proceeds with the main analyses, which examine the effects of the study's two factors on performance in the comprehension tests. Finally, a complementary analysis explores the cognitive load perceived by participants following Test 1, in order to interpret the results through the lens of mental effort mobilized.

4.1 Preliminary Analyses

Before examining the effects of the experimental manipulation, preliminary analyses were conducted to verify group homogeneity across three variables measured prior to the task: perceived proficiency in oral French, perceived proficiency in written French, and familiarity with the video topic. These variables were assessed using ordinal scales and compared across the four experimental groups using the Kruskal–Wallis test.

Table 2. Mean Ranks by Experimental Group

Variable	G1	G2	G3	G4	<i>p</i> (Kruskal–Wallis)
Perceived oral French level	41.50	43.80	37.76	39.50	.822
Perceived written French level	41.94	34.35	48.30	36.45	.152
Familiarity with the topic	43.94	40.50	41.35	36.60	.738

The results (see Table 2) revealed no significant differences between groups for perceived oral French proficiency ($H(3) = 0.913$; $p = .822$) or familiarity with the topic ($H(3) = 1.261$; $p = .738$). However, a non-significant trend was observed for perceived written French proficiency ($H(3) = 5.287$; $p = .152$), suggesting slight variation in mean ranks across groups without reaching statistical significance. These findings support the assumption that the groups were generally homogeneous at baseline, ruling out the possibility of initial bias related to perceived language proficiency or topic familiarity.

4.2 Main Analyses

4.2.1 Analysis of Test 1 Scores

A between-subjects analysis of variance (ANOVA) was conducted to examine the effects of the study's variables on scores obtained in Test 1. The analysis revealed a significant main effect of feedback type ($F(1,92) = 6.929$; $p = .010$; $\eta^2 = .070$), with participants receiving elaborated feedback scoring higher ($M = 5.547$) than those receiving simple feedback ($M = 4.091$). No significant main effect was found for interactivity type ($F(1,92) = 0.305$; $p = .582$; $\eta^2 = .003$), although the means suggest a slight trend favoring interactivity during viewing ($M = 4.972$) over interactivity after viewing ($M = 4.667$) (see Table 3).

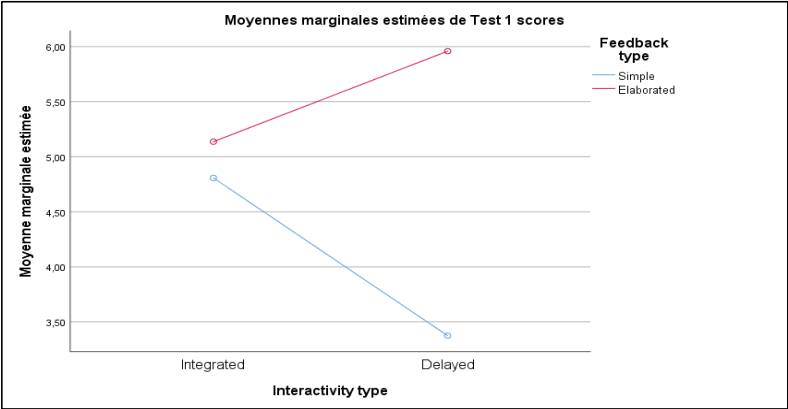
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Table 3. Descriptive Statistics for Test 1 Scores

Experimental Group	Mean	SD	Min	Max	N
Group 1	5.14	2.88	1.00	10.00	22
Group 2	4.81	2.98	1.00	10.00	26
Group 3	5.96	2.73	0.00	10.00	24
Group 4	3.38	2.14	0.00	7.00	24
Total	4.81	2.82	0.00	10.00	96

A significant interaction between feedback type and interactivity type was also observed ($F(1,92) = 4.154; p = .044$), indicating that the effect of feedback on performance varied depending on the type of interactivity (see Figure 1). Estimated marginal means show that the lowest score occurred in the “simple feedback – interactivity after viewing” condition ($M = 3.375$), while the highest score was recorded in the “elaborated feedback – interactivity after viewing” condition ($M = 5.958$). These trends confirm that elaborated feedback is generally associated with better performance, and that its effectiveness appears to be enhanced when combined with delayed interactivity.

Fig. 1. Interaction Between Feedback and Interactivity on Test 1 Scores



4.2.2 Analysis of Test 2 Scores

A between-subjects ANOVA was conducted to examine the effects of the study’s variables on Test 2 scores. The main effect of feedback type was not significant ($F(1,65) = 1.807$; $p = .184$; $\eta^2 = .027$), although estimated marginal means suggest slightly higher scores in the elaborated feedback condition ($M = 6.51$) compared to the simple feedback condition ($M = 5.59$). Similarly, no significant main effect was found for interactivity type ($F(1,65) = 2.097$; $p = .152$; $\eta^2 = .031$), though the means indicate a trend favoring interactivity during viewing ($M = 6.55$) over interactivity after viewing ($M = 5.55$) (see Table 4).

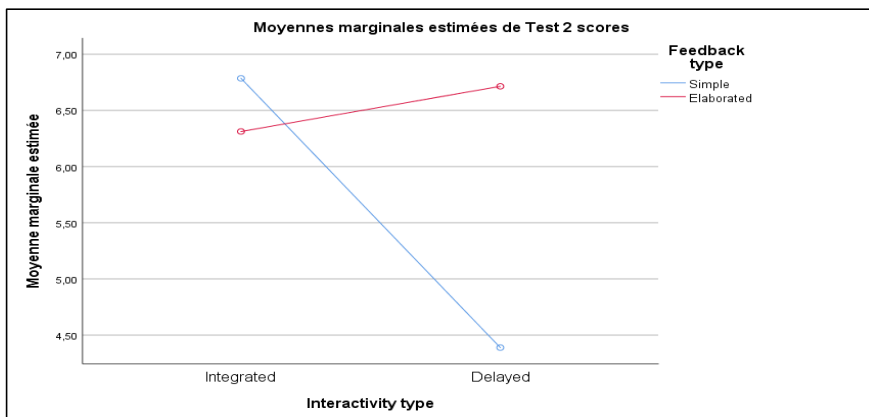
Table 4. Descriptive Statistics for Test 2 Scores

Experimental Group	Mean	SD	Min	Max	N
Group 1	6.31	3.24	0.00	10.00	16
Group 2	6.79	2.33	3.00	10.00	14
Group 3	6.71	2.94	1.00	10.00	21
Group 4	4.39	2.66	1.00	9.00	18
Total	6.03	2.94	0.00	10.00	69

However, a significant interaction between the two factors was observed ($F(1,65) = 4.126$; $p = .046$; $\eta^2 = .060$), indicating that the effect of feedback on performance varied depending on the type of interactivity. The observed means show that the lowest score occurred in the “simple feedback – interactivity after viewing” condition ($M = 4.39$), while the highest score was recorded in the “simple feedback – interactivity during viewing” condition ($M = 6.79$). This reversal in trend suggests that interactivity during viewing may compensate for the simplicity of feedback, whereas interactivity after viewing appears less favorable when paired with minimal feedback (see Figure 2).

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Fig. 2. Interaction Between Feedback and Interactivity on Test 2 Scores



4.2.3 Score Progression Between Tests 1 and 2

A repeated-measures ANOVA was conducted to examine performance progression between Test 1 and Test 2 (within-subject factor: time), based on feedback type and interactivity type, considered as between-subjects factors. The analysis revealed a significant main effect of time ($F(1,61) = 29.410$; $p < .001$; $\eta^2 = .325$), indicating an overall improvement in scores between the two tests. Descriptive means confirm this progression: the average score increased from $M = 4.69$ in Test 1 to $M = 5.95$ in Test 2 (see Table 5).

Table 5. Score Progression Between Tests 1 and 2

Feedback Type	Interactivity Type	Mean Test 1	Mean Test 2	Progression
Simple	During viewing	4.36	6.79	+2.43
Simple	After viewing	3.24	4.35	+1.11
Elaborated	During viewing	5.38	6.31	+0.93
Elaborated	After viewing	5.72	6.50	+0.78

The interaction between time and feedback type approached significance ($F(1,61) = 3.561$; $p = .064$), suggesting that performance progression may vary depending on feedback nature. Results show that participants receiving simple feedback improved from $M = 3.74$

to $M = 5.45$, while those receiving elaborated feedback progressed from $M = 5.56$ to $M = 6.41$.

No significant interaction was found between time and interactivity type ($F(1,61) = 2.298$; $p = .135$), nor among all three factors combined ($F(1,61) = 1.408$; $p = .240$), although descriptive means suggest differentiated trends. Notably, participants receiving simple feedback after viewing showed more limited progression ($M = 3.24 \rightarrow M = 4.35$) compared to those receiving elaborated feedback in the same condition ($M = 5.72 \rightarrow M = 6.50$).

4.3 Complementary Analyses

4.3.1 Perceived Cognitive Load Analysis

A between-subjects ANOVA was conducted to examine the effects of the study’s variables on perceived cognitive load, measured using a 4-point Likert scale. The results (see Table 6) revealed no significant main effect for feedback type ($F(1,76) = 0.183$; $p = .670$) or interactivity type ($F(1,76) = 0.019$; $p = .890$). The interaction between the two factors also did not reach significance ($F(1,76) = 2.476$; $p = .120$), although descriptive means suggest differentiated trends.

Table 6. Descriptive Statistics for Perceived Cognitive Load

Feedback Type	Interactivity Type	Mean	SD	N
Simple	During viewing	2.85	1.14	20
Simple	After viewing	3.25	1.07	20
Elaborated	During viewing	3.12	0.86	17
Elaborated	After viewing	2.78	1.04	23
Total	During viewing	2.97	1.01	37
Total	After viewing	3.00	1.07	43
Overall		2.99	1.04	80

Estimated marginal means indicate slightly higher cognitive load in the “simple feedback” condition ($M = 3.05$) compared to the “elaborated feedback” condition ($M = 2.95$), with comparable scores across interactivity types ($M = 2.98$ vs. $M = 3.02$). However, observed means show the highest cognitive load in the “simple feedback – after viewing” condition ($M = 3.25$), and the lowest in the “elaborated

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feedback – after viewing” condition ($M = 2.78$), suggesting a moderate interaction between the two factors.

4.3.2 Relationship Between Perceived Cognitive Load and Test 1 Performance

A Spearman correlation was calculated to examine the relationship between perceived cognitive load and scores obtained in Test 1. This non-parametric test was chosen due to the ordinal nature of the cognitive load variable, measured on a 4-point Likert scale. The results (see Table 7) indicate a significant negative correlation ($\rho = -.256$; $p = .025$), suggesting that higher perceived cognitive load is associated with slightly lower performance in Test 1. Although moderate, this relationship highlights the potential impact of perceived cognitive load on immediate comprehension of instructional content.

Table 7. Spearman Correlation Between Perceived Cognitive Load and Test 1 Score

Correlated Variables	Spearman's ρ	p (two-tailed)	N	Interpretation
Cognitive Load $\leftrightarrow$ Test 1 Score	-.256	.025	77	Significant negative correlation

Note: The correlation is significant at the 0.05 level (two-tailed). A significant negative correlation indicates that higher perceived cognitive load is associated with slightly lower performance on Test 1.

4.3.3 Regression Analysis: Predictors of Test 1 Performance

A multiple linear regression was conducted to examine the extent to which perceived cognitive load, feedback type, and interactivity type predict performance on Test 1. The model was statistically significant ($F(3,73) = 4.208$; $p = .008$), with $R^2 = .147$, indicating that the three variables explain approximately 15% of the variance in Test 1 scores (see Table 8). Although the model's fit remains modest (adjusted $R^2 = .112$), it is statistically defensible.

Table 8. Multiple Linear Regression Coefficients (Test 1 Score as Dependent Variable)

Predictor	B (Unstandardized)	Standard Error	β (Standardized)	<i>t</i>	<i>p</i>
(Constant)	4.381	1.603	—	2.733	.008
Feedback Type	1.751	0.615	.309	2.847	.006
Interactivity Type	−0.360	0.614	−.063	−0.586	.560
Perceived Cognitive Load	−0.549	0.294	−.202	−1.867	.066

Among the predictors, only feedback type emerged as significant ($\beta = .309$; $p = .006$), suggesting that participants who received elaborated feedback achieved higher scores. Perceived cognitive load showed a negative trend ($\beta = -.202$; $p = .066$), approaching significance, which corroborates the correlation results. Interactivity type, however, had no significant effect ($p = .560$). These findings suggest that feedback quality plays a decisive role in immediate performance, while perceived cognitive load may exert a moderate inhibitory effect, warranting further investigation in complementary analyses.

4. DISCUSSION

The results confirm that oral comprehension in a foreign language, as described by Field (2008) and Vandergrift & Goh (2012), involves a series of simultaneous cognitive processes whose effectiveness can be modulated by targeted pedagogical interventions. Within this framework, elaborated feedback emerges as a particularly effective lever: participants who received structured and explicit feedback achieved significantly higher scores on Test 1. This result suggests that feedback goes beyond a corrective function and plays an active role in learners’ cognitive regulation. It facilitates mental organization of content, clarifies expectations, and supports attention—functions commonly associated with formative feedback in the literature (Elbaoui & Jember, 2024; Hattie & Timperley, 2007). This finding confirms the study’s first hypothesis: elaborated feedback

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enhances oral comprehension performance.

The isolated effect of interactivity type was not significant, which may seem counterintuitive given the pedagogical emphasis often placed on interactive features in digital environments. However, our results invite a more nuanced interpretation: interactivity alone does not suffice to improve performance, but its timing and alignment with feedback modulate its effectiveness. In Test 1, interactivity after viewing appears to reinforce the effect of elaborated feedback, while in Test 2, interactivity during viewing compensates for simple feedback. These dynamics suggest that interactivity functions as a contextual modulator, whose impact depends on the level of cognitive support already present. This observation leads us to refine the second hypothesis, which posited a main effect of interactivity type: while this effect is not confirmed in isolation, its interaction with feedback reveals more complex pedagogical mechanisms, thereby confirming the study's third hypothesis.

The analysis of score progression between the two tests reveals overall improvement, indicating an expected learning effect. This improvement is particularly pronounced among participants who received simple feedback, which may reflect a catch-up effect or delayed mobilization of cognitive resources. The data suggest that elaborated feedback promotes higher immediate performance, while simple feedback, though less effective in the short term, may stimulate more sustained engagement. This phenomenon warrants further exploration, particularly through retention or transfer measures. It is also possible that learners who received simple feedback were more inclined to reconstruct meaning independently, which may have fostered more active consolidation between the two tests. These observations extend the initial hypotheses by showing that feedback effects are not limited to immediacy but unfold within an evolving dynamic.

Although perceived cognitive load did not vary significantly

across experimental conditions, it was negatively correlated with performance on Test 1. This finding supports the assumptions of cognitive load theory (Paas & van Merriënboer, 1994; Sweller, 1988), which posits that mental overload limits working memory processing capacity. Well-designed interactivity can therefore reduce extraneous load and enhance performance. In our study, cognitive load appears to act as a transversal factor, potentially interacting with feedback and interactivity to modulate the effectiveness of the instructional design. Although this variable was not explicitly hypothesized, its moderate inhibitory role, identified in complementary analyses, deserves consideration in the overall interpretation of results.

The fact that cognitive load was highest in the “simple feedback – interactivity after viewing” condition and lowest in the “elaborated feedback – interactivity after viewing” condition reinforces the idea that pedagogical calibration directly influences perceived mental effort. These results suggest that delayed interactivity, when paired with structured feedback, enables learners to better anticipate expectations and allocate cognitive resources more efficiently. Conversely, the absence of explicit guidance combined with late interactivity may generate disorientation or overload, particularly in dense and specialized oral reception tasks. These observations enrich the interpretation of interaction effects by showing that the combination of pedagogical variables can either mitigate or amplify perceived cognitive load.

Finally, the multiple regression model confirms that feedback type is the most robust predictor of Test 1 performance, while perceived cognitive load shows a moderate inhibitory trend. Interactivity type, however, has no significant effect in this model, prompting reconsideration of its role in digital learning environments. These findings align with Mayer’s (2021, 2024) conclusions, which emphasize that interactivity yields benefit only when aligned with principles of cognitive guidance and metacognitive regulation. They

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also confirm that designing effective oral comprehension environments cannot rely solely on adding interactive features, but must be grounded in thoughtful pedagogical engineering that accounts for the cognitive constraints inherent to foreign language oral reception. In sum, the main hypotheses are partially confirmed: the effect of feedback is clearly established, while the effect of interactivity depends on its integration within the instructional design and warrants further exploration in varied configurations.

6. CONCLUSION

This study examined the combined effects of feedback type and interactivity type on oral comprehension in French for Specific Purposes (FSP), within a university context where French is taught as a foreign language to non-language-specialist economics students. The results show that elaborated feedback significantly improves immediate performance, while interactivity—although not yielding a main effect—acts as a contextual modulator whose effectiveness depends on its timing and alignment with feedback. Perceived cognitive load, meanwhile, shows a negative relationship with performance, suggesting that high mental demand may hinder real-time processing of oral discourse.

These findings carry several pedagogical implications. They underscore the importance of designing digital environments that incorporate explicit, structured feedback capable of supporting cognitive regulation and clarifying expectations. They also invite us to view interactivity not as mere animation, but as a guiding tool whose timing and format must be adjusted to pedagogical objectives. Finally, they highlight the need to minimize extraneous cognitive load by ensuring clear instructions, segmented content, and ergonomic interfaces. While these principles are well established in multimedia learning environments (Mayer, 2021), they warrant adaptation to the specific demands of oral reception in a foreign language.

The study does, however, present certain methodological

limitations. Although the sample size was sufficient for the analyses conducted, it remains modest for modeling fine-grained effects or testing complex interactions. The measurement of cognitive load, based on a Likert scale, does not capture all dimensions of mental effort and would benefit from being complemented by physiological or behavioral indicators. Moreover, the experimental protocol relied on a single video and topic (crowdfunding), which limits the generalizability of the findings to other FSP content areas. Finally, the observed effects on immediate performance do not allow conclusions about retention or transfer of learning.

These observations open several avenues for future research. It would be relevant to explore mediation models to test whether cognitive load plays an intermediary role between feedback and performance. Longitudinal studies could examine the delayed impact of feedback and interactivity on retention and transfer. It would also be valuable to investigate richer forms of interactivity—adaptive guidance, personalized feedback, dynamic scripting—and their alignment with explicit metacognitive strategies. Lastly, the pedagogical calibration of feedback, based on learners' linguistic level and cognitive profile, deserves further investigation across varied contexts.

Beyond its specific findings, this research contributes to a deeper understanding of pedagogical scaffolding mechanisms in oral reception, within digital environments designed for learners for whom the target language is not a field of specialization but a medium for disciplinary training. It highlights the complexity of interactions between didactic and cognitive variables and emphasizes the need for finely tuned instructional design grounded in robust theoretical principles and contextualized empirical data. By bridging insights from cognitive psychology, language didactics, and educational sciences, it paves the way for learning environments that are more responsive to learners' real needs and more effective in mediating

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meaning.

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6. Appendices

Appendix I: Video Transcript²

Antoine Fonteneau, host of JTNT – *Le Journal des nouvelles technos* on TV5MONDE: On today's agenda, the success of crowdfunding on the Internet. Hello everyone. It's called "crowdfunding" or "financement participatif." In any case, many startups now turn to this alternative financing method. Why is it so successful? We'll discuss that in a moment with Vincent Ricordeau, CEO of KissKissBankBank. But first, our product spotlight. You may have heard of the Oculus Rift, which kicked off the virtual reality headset trend. Well, it was thanks to funds raised on Kickstarter that this technology came to life. Kickstarter is one of the most famous crowdfunding sites; it's American, by the way. In France, the best-known platforms include My Major Company, Ulule, and KissKissBankBank. They all operate similarly. Projects are preselected by the platform across various domains: technology, humanitarian causes, or the arts. They are then presented on a webpage, often with photos and video. The goal is to raise awareness among potential funders—the general public, you and me. If the funding goal is reached within the allotted time, the project goes ahead. Otherwise, the funds are returned to individual donors, who always receive something in return—sometimes modest, sometimes the product itself, and in rare cases, a share of the profits.

Now, two questions for Vincent Ricordeau. Hello.

Vincent Ricordeau, CEO of KissKissBankBank: Hello.

Antoine Fonteneau: You're the founder of KissKissBankBank, one of the pioneers in crowdfunding. How do you explain its success today?

Vincent Ricordeau: It's actually quite simple. It's a way of reclaiming control over your money. Instead of letting it sit idle in banks, you choose to invest or donate it to a project that holds personal meaning. The second reason is that when you fund a project, you receive a piece of it in kind: a signed item, a CD, an invitation—potentially the product you helped fund. So you enter a strong exchange dynamic with the creator, where the logic is to co-create and bring a multitude of projects to life together.

Antoine Fonteneau: And how do you see the future of crowdfunding? Do you hope to replace banks one day?

Vincent Ricordeau: Replace banks? No. But at the start of crowdfunding, like on KissKissBankBank, we created a logic of emotional return on investment—that's really the number one driver for people. Today, our approach is expanding to other types of creators, especially more traditional SMEs. On some of our platforms, like Lendopolis, people can become micro-investors, whereas on KissKissBankBank,

² The original video and transcript were in French. The video was used as instructional material during the experiment and is available on the *TV5MONDE Enseigner* platform.

they were micro-patrons. As micro-investors, they invest or lend money to SMEs, which then repay them—with a fairly substantial interest rate, between 5 and 10%. So we're in two potential zones: you might wake up on Monday wanting to support an artist's project, and on Tuesday, invest directly in the real economy. So no, we're not replacing banks, but we are filling a gap and responding to a real shortcoming in traditional financial markets.

Stay with us, Vincent Ricordeau—we'll continue this conversation on tv5monde.com. See you shortly. That's the end of this JTNT. See you next Sunday on TV5MONDE.

Appendix II: Comprehension Questions and Feedback³

Question / Timestamp	Answer Choices	Feedback
Q1 – 0:33 The video discusses crowdfunding, mainly used by certain businesses. Which statement is correct?	A) This model is called “Fundraising” in English and mainly concerns public companies. ☐ B) It's called “Crowdfunding” in English and is mostly used by startups. C) It's known as “Microfinancing” and mainly concerns large corporations. D) It's called “Crowdsourcing” and is reserved for charitable organizations.	☐ Well done! The term “crowdfunding” refers to participatory financing in English and is especially used by startups due to their specific financial needs. ☐ Think about the English term that combines “crowd” and “funding.” Also, which businesses most need alternative financial support?
Q2 – 0:54 Oculus Rift, a virtual reality technology, was funded by which platform and in which country?	A) Ulule – United States B) My Major Company – France ☐ C) Kickstarter – United States D) KissKissBankBank – France	☐ Bravo! Kickstarter, an American platform, played a key role in funding Oculus Rift, contributing to the rise of virtual reality headsets. ☐ That's not the correct answer! Think carefully about the platform that funded Oculus Rift and specializes in supporting tech innovations.
Q3 – 1:11 How do crowdfunding platforms operate, and who funds the projects?	☐ A) Platforms select projects, and individuals fund their realization. B) Platforms directly fund projects without external help. C) Platforms allow all projects to be funded without any selection. D) Only large companies can fund projects.	☐ Well done! Platforms don't directly give money to projects. They play a key role in selecting which projects can be published and promoted. Then, individuals decide whether to fund them. ☐ Platforms facilitate funding,

³ The original questions and feedback were administered in French.

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		but do they themselves provide money? And can all projects be published freely, or must they be selected first?
Q4 – 1:30 In crowdfunding, what happens if a project doesn't reach its goal, and what can donors receive if it succeeds?	A) Funds are returned to donors if the project fails; if successful, they receive a symbolic reward. ☐ B) The platform keeps the money if the project fails and offers financial compensation to donors. C) Donors always receive a reward even if the project fails. D) The platform covers the funding gap and offers a share of profits to donors.	☐ Well done! As explained in the video, if a project doesn't reach its goal, funds are returned to donors and the project cannot proceed. However, when funding succeeds, contributors may receive a reward: a product, a thank-you message, or in rare cases, a share of profits. ☐ According to the video, what happens to the donors' money if the funding goal isn't met? And when the project succeeds, what types of rewards are mentioned?
Q5 – 1:53 Why do some funders prefer to support projects via crowdfunding rather than leave their money in the bank?	A) Because they prefer to use their money to support meaningful projects rather than leave it idle in the bank. ☐ B) Because crowdfunding guarantees higher returns than traditional savings. C) Because banks impose excessive fees on savings, making project investment more profitable. D) Because projects funded via crowdfunding are always safer than bank investments.	☐ Exactly! Funders choose crowdfunding because they prefer their money to support meaningful projects rather than remain idle in the bank. ☐ Not quite! Think about what might encourage a funder to invest differently instead of simply keeping their money in the bank.
Q6 – 2:12.5–2:12.8 Why does crowdfunding give funders a sense of involvement in the creative process?	A) Because they can demand compensation for their financial support. ☐ B) Because they receive a material reward from the creator, strengthening their connection to the project. C) Because they gain decision-making power over the project's development. D) Because they automatically become official co-authors of the project.	☐ Exactly! Funders receive a material reward from the creator, which draws them more deeply into the project and strengthens their sense of involvement. ☐ That's not the correct answer! Think about what funders receive in exchange for their support and how that increases their involvement.
Q7 – 2:28 What logic is promoted by the KissKissBank Bank platform?	A) Financial return is prioritized over emotional return. ☐ B) Emotional return is valued more than financial return. C) Financial gains are guaranteed for all funders. D) Funders gain decision-making power in the project.	☐ Exactly! KissKissBankBank emphasizes emotional return on investment, which creates a strong bond between funders and projects, surpassing financial interest. ☐ That's not the correct answer! Think about what aspect of

		crowdfunding attracts funders beyond simple financial profit.
Q8 – 2:44 What was the original purpose of crowdfunding, and what can contributors do today?	A) Initially, it was used to create businesses. Now, contributors only fund for-profit SMEs. B) It used to help struggling banks. Today, it allows donors to earn money. □ C) Initially, it provided personal satisfaction. Now, it allows investment in SMEs. D) Its goal was profit-making. Today, it mainly funds artistic projects.	□ Well done! In the past, crowdfunding allowed people to support projects for personal satisfaction, without financial gain. Today, it also enables investment in businesses like SMEs. □ Crowdfunding wasn't originally focused on financial profit. Contributors sought something else when supporting a project... And today, their role has evolved. What is it?
Q9 – 3:01 What's the difference between a micro-patron and a micro-investor? What kind of financial return do micro-investors receive?	A) Micro-patrons lend money with 5–10% interest, and micro-investors are repaid without interest. □ B) Micro-patrons donate without return, and micro-investors receive 5–10% interest. C) Micro-patrons fund artists, and micro-investors get a tax deduction. D) Micro-patrons receive a share of profits, and micro-investors receive nothing.	□ Exactly! A micro-patron supports a project without expecting financial return, while a micro-investor lends money with an interest rate, often between 5 and 10%. □ Think about each contributor's goal: some fund to help without return, others want to recover their investment with profit. How does this distinction work?
Q10 – 3:10 If crowdfunding doesn't replace banks, how does it address a gap in traditional financial markets?	A) It's evolving and may replace banks in the future. □ B) It funds projects ignored by banks and traditional markets. C) It guarantees fixed interest rates and large-scale secured loans. D) It is limited to supporting artistic and cultural projects only.	□ Well done! Crowdfunding doesn't aim to replace banks, but it fills a gap by funding projects excluded from conventional financial circuits. □ Think about the goal of crowdfunding: why do project creators turn to it when banks can't help? What kind of funding are they missing?

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Appendix III: Distractor Questionnaire Items⁴

Construct	Question Item	Response Scale
Familiarity with the video topic	Did you have prior knowledge of the topic addressed in the video before today, i.e., before participating in this experiment?	- Yes, in-depth knowledge - Yes, limited knowledge - No, I had never heard of it
Perceived oral French proficiency	How would you rate your level of comprehension in oral French?	- Excellent - Good - Average - Weak - Very weak
Perceived written French proficiency	How would you rate your level of comprehension in written French?	
Perceived cognitive load – G1	Concentrating on the video content, answering questions, and reading feedback was mentally demanding for you.	- Strongly agree - Agree - Disagree - Strongly disagree
Perceived cognitive load – G2	Concentrating on the video content and answering questions was mentally demanding for you.	
Perceived cognitive load – G3	Concentrating on the video content, answering all questions at once without rewatching the video, and reading feedback was mentally demanding for you.	
Perceived cognitive load – G4	Concentrating on the video content and answering all questions at once without rewatching the video was mentally demanding for you.	

⁴ The original questionnaire was administered in French. Items were designed to assess prior knowledge, perceived language proficiency, and cognitive load across experimental conditions.