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IRF AI Integration in a Public Speaking Class: Classroom Discourse and AI Feedback Using a Hugging Face Space

Rusdiah[1]
Rizkariani Sulaiman[2]
Husnul Mujaddidah[3]
[123]Universitas Muslim Indonesia, Indonesia

[1] rusdiah.rusdiah@umi.ac.id
[2] rizka.sulaiman@umi.ac.id
[3] Husnul.mujaddidah@umi.ac.id

Abstract

This study investigates how the Initiation Response Feedback (IRF) pattern, integrated with an AI-based feedback tool, supports public speaking instruction in an English as a Foreign Language (EFL) context. It examines (1) how IRF patterns emerge in classroom interaction, (2) how IRF contributes to feedback effectiveness and students' public speaking performance, and (3) how an AI tool, AI Feedback Presentation, a Gradio application deployed on Hugging Face Spaces is positioned within the feedback ecosystem and students' academic literacy. The research adopts a qualitative classroom discourse analysis design. Participants were 19 third semester students enrolled in a Public Speaking course in an English Literature program at a private university in Makassar, Indonesia. Data were collected through participant observation, audio video recordings, verbatim transcripts of four key meetings, and pilot logs from the AI Feedback Presentation application. The four meetings focused on polite (dis)agreement, formal presentation structure and peer feedback, discussions on empathy, plastic use, AI and academic honesty, and modeling of expert speeches. Data were analyzed by segmenting IRF sequences, coding feedback types, and developing themes related to public speaking skills and AI use. Findings show that IRF is consistently employed to scaffold students' spoken production from short responses to structured, polite opinions and formal presentations. The combination of IRF with recasts, metalinguistic explanations, elaborative feedback, and affective support enhances students' awareness of politeness, speech organization, and delivery (eye contact, intonation, body language). The AI Feedback Presentation tool provides automatic transcription and simple performance metrics, which function as triggers for reflection rather than grading mechanisms. Students perceive AI as a useful assistant for grammar and idea generation, while also recognizing risks to academic honesty. The study proposes an IRF AI framework in which human and AI feedback are complementary in public speaking instruction.

Keywords: *IRF pattern, AI feedback, Hugging Face Space, public speaking, classroom discourse*

Introduction

Public speaking is a core competence for university students in English language and literature programs. It includes grammatical accuracy and fluency, but also organization, pragmatic appropriateness, and non verbal delivery such as eye contact, intonation, and body language (Aprillia et al., 2024; Imamuna et al., 2024). Previous research has used simulation techniques (Aprillia et al., 2024), genre based materials (Imamuna et al., 2024), virtual reality (Utami & Kurniawan, 2024), and flipped social collaborative strategies (Hwang et al., 2023) to support speaking skills.

Classroom discourse research shows that the Initiation Response Feedback (IRF) pattern remains central to language classroom interaction (Hasanah et al., 2024; Rahayu et al., 2022; Kartini et al., 2022; Hidayatullah, 2024). In IRF sequences, teachers initiate talk, students respond, and teachers provide feedback. Studies in Indonesian EFL classrooms report that IRF is used to control classroom flow and provide linguistic support (Ariska et al., 2024; Puspitasari et al., 2024). Yet, IRF is often treated as a static pattern rather than a flexible framework that can be combined with technology enhanced feedback.

In parallel, research on AI based feedback tools has expanded considerably. Reviews and bibliometric analyses highlight the use of AI for automated assessment, formative feedback, and multimodal learning analytics (Dönmez, 2024; Marengo et al., 2025). In public speaking, AI powered systems have been proposed to analyze speech and offer feedback on prosody and tempo (Padia et al., n.d.). However, this work mostly focuses on technological performance and learning outcomes and less on how AI feedback interacts with existing classroom practices and ethical concerns (Yang et al., 2022).

In the same institutional context as this study, Rusdiah and Sulaiman (2024) examined interaction strategies used by a lecturer to enhance student engagement in a Public Speaking course, but did not focus on IRF patterns or AI integration. Considering the rapid diffusion of generative AI tools, there is a need to understand how traditional IRF based interaction and AI feedback can be combined in a principled way.

This study therefore explores the integration of IRF patterns and an AI Feedback Presentation, a Gradio app deployed on Hugging Face Spaces in a university Public Speaking course. It addresses the following questions:

1. How do IRF patterns emerge in classroom interaction during the Public Speaking course?
2. How does the IRF pattern contribute to feedback effectiveness and students' public speaking performance?
3. How is the AI Feedback Presentation tool positioned and used within the feedback ecosystem and students' literacy practices?

Method

Research Design

This study used a qualitative descriptive design with classroom discourse analysis. The focus was on capturing naturally occurring interaction and interpreting how IRF and AI based feedback were enacted in context.

Context and Participants

The research took place in an English Literature program at Universitas Muslim Indonesia Makassar, Indonesia. Participants were 19 third semester students in a Public Speaking course and their lecturer. The course emphasized formal public speaking in English, including expressing opinions, debate, and academic presentations.

AI Tool: AI Feedback Presentation

The AI component was AI Feedback Presentation, a web based application built with Gradio and deployed as a Hugging Face Space. The app uses faster whisper for automatic speech transcription for presenting simple performance metrics such as recording length, number of words, and estimated words per minute. In this pilot, the tool was used mainly outside class time, selected student recordings and one model speech

were uploaded, and resulting transcripts and metrics were used as prompts for reflection. The tool did not assign scores.

Data Collection

Four meetings were selected because they represented key stages of the course: Meeting 1: Polite (dis)agreement; Meeting 2: Formal presentation structure and peer feedback; Meeting 3: Empathy, plastic use, AI and academic honesty (online); Meeting 4: Modeling expert speeches.

Data sources comprised audio video recordings of these meetings, verbatim transcripts, field notes from participant observation, and pilot logs from the AI Feedback Presentasi app.

Data Analysis

Analysis followed four steps: 1. IRF segmentation to identifiedInitiation (I), Response (R), and Feedback (F) moves in transcripts; 2. Feedback coding to categorized F moves into recast, metalinguistic explanation, content elaboration, and affective feedback (Ariska et al., 2024; Hidayatullah, 2024); 3. Thematic analysis to develop themes around politeness, structure, delivery, and AI/academic honesty; 4. IRF AI synthesis: to triangulated discourse findings with AI logs to conceptualize an IRF AI framework. Credibility was supported through triangulation of data sources and peer debriefing with another lecturer.

Results

IRF Patterns in Four Meetings

Across all meetings, IRF sequences were frequent and served different functions. In Meeting 1, the lecturer initiated with opinion questions and transformation tasks, such as asking students to reformulate "you are wrong" into more polite expressions. Early responses were short and often direct ("you are wrong," "that is stupid"). Feedback included recasts (e.g., "I'm not sure that's the best idea"), explanations of polite opinion openers (*in my view*, *I personally think*), and reassurance to reduce anxiety.

In Meeting 2, initiation involved explicit explanation of introduction, body, conclusion and signposting, followed by prompts such as "What makes a good presenter?" after viewing video clips. Students responded by naming delivery features and later performed mini presentations. Feedback elaborated their ideas into explicit criteria (good vs. poor presenters) and pointed to missing elements in openings and closings.

Meeting 3, conducted online, used controversial statements about AI and academic honesty to initiate discussion. Students responded with pro and con arguments, acknowledging both AI's usefulness for grammar and ideas and its potential to undermine honesty. Feedback emphasized ethical boundaries, careful use of AI, and the importance of maintaining a personal voice in academic work.

In Meeting 4, initiation involved watching expert speeches and asking students to notice metaphors, repetition, and emotional arcs. Students responded mainly through reflective comments, identifying memorable lines and strategies. Feedback clarified that students did not need to imitate advanced vocabulary, but could adapt sentence patterns and pauses that fit their own level.

Contribution of IRF to Feedback and Performance

The IRF pattern supported students' public speaking skills in three main areas: Politeness and stance: Through repeated I–R–F cycles in Meeting 1, students moved from blunt

statements to more diplomatic expressions ("I'm sorry but I have to disagree," "I'm not sure that's the best idea"), indicating growth in pragmatic competence; Organization: Meetings 2 and 3 helped students internalize the need for a clear introduction, body, and conclusion, supported by signposting language. Feedback directly targeted missing structural components and reinforced successful attempts; Delivery: Discussion of good and poor presenters and subsequent feedback made students more aware of eye contact, voice modulation, and body language. Some students reported rehearsing more deliberately after these sessions.

Role of AI Feedback Presentation

The AI Feedback Presentation tool complemented IRF based feedback rather than replacing it. When recordings were uploaded, the app produced transcripts and metrics that were shared with students individually. Students used transcripts to compare what they intended to say with what they actually said, noticing skipped points and excessive fillers. Speech rate metrics (words per minute) allowed them to reflect on whether they spoke too quickly or too slowly.

In one activity, an AI generated paragraph on a discussion topic was juxtaposed with a student's spoken explanation as transcribed by the tool. Students observed that the AI text sounded "too perfect" and less like their own style, which reinforced the lecturer's message about authenticity and understanding.

The tool was deliberately framed as a diagnostic and reflective aid, not a grading engine. This positioning aligns with recommendations that AI feedback tools be combined with teacher mediation and attention to learner autonomy (Dönmez, 2024; Marengo et al., 2025; Yang et al., 2022).

Summary of IRF AI Implementation

Table 1 summarises how IRF and AI Feedback Presentation were used in each meeting.

Table 1
IRF Patterns and AI Feedback Presentasi Use Across Four Meetings

Meeting	Focus	Typical Initiations (I)	Response Characteristics (R)	Feedback Types (F)	Role of AI Feedback Presentasi
1	Polite (dis)agreement	Opinion questions; reformulating direct expressions	Short, hesitant; increasingly polite forms	Recasts; metalinguistic explanations; affective support	Pilot use; a few recordings uploaded to test transcription
2	Speech structure & peer feedback	Explanation of structure; "What makes a good presenter?"	Lists of features; mini-presentations	Content elaboration; criteria formulation; feedback on openings/closings	Selected mini presentations analyzed for transcript and speech rate
3	Empathy, plastic, AI & honesty	Controversial statements about AI and honesty	Pro–con arguments referencing AI benefits and risks	Clarification; ethical guidance; emphasis on personal voice	AI generated text compared with student transcripts to

					highlight differences
4	Modeling expert speeches	Requests to notice language and emotion in expert speeches	Reflective noticing and note-taking	Guidance on adapting patterns rather than vocabulary	One expert speech processed as demonstration of tool capabilities

Discussion

IRF as a Scaffold for Pragmatics, Organization, and Delivery

The findings confirm earlier work showing the prevalence of IRF in language classrooms (Hasanah et al., 2024; Kartini et al., 2022; Rahayu et al., 2022), but they also extend this literature in two important ways. First, in this course the IRF pattern was not treated simply as a default recitation script for checking comprehension. Instead, it was deliberately engineered as a scaffold for three intertwined dimensions of public speaking: pragmatic development, discourse organization, and delivery.

In the politeness focused tasks, for example, "I" moves did more than elicit correct linguistic forms; they positioned students in situations where they had to negotiate stance and face, while "F" moves reformulated their attempts into socially acceptable, context-sensitive expressions. Similarly, in meetings on formal presentations, IRF sequences were oriented toward helping students internalize macro structures (introduction, body, conclusion, signposting) rather than isolated sentences. This functional use of IRF resonates with genre based and simulation oriented approaches to speaking, where learners are supported to appropriate discourse patterns and communicative moves rather than merely accumulate vocabulary or grammar items (Aprillia et al., 2024; Imamuna et al., 2024). In other words, the data suggest that IRF can serve as a dynamic "pedagogical engine" that drives movement from local form correction to global discourse control when teachers purposefully design their initiations and feedback.

AI Feedback Environment

Second, and more novel, IRF in this study was combined with an AI tool hosted as a Hugging Face Space, resulting in a hybrid feedback environment. The AI Feedback Presentataion app generated forms of feedback precise word counts, speech rate calculations, and near-instant transcripts that human observers would struggle to produce consistently in real time. These quantitative traces of performance added a new layer to the "F" move: alongside qualitative comments from the lecturer, students could inspect numerical indicators of how they spoke.

However, the classroom data show that the pedagogical value of this AI layer depended strongly on the lecturer's framing. Because the tool was introduced as a *reflective aid* rather than as an automated assessor, students tended to treat its output as one source of evidence to be interpreted, not as a final verdict on their ability. This stance is consistent with broader arguments in the AI-based feedback and multimodal learning analytics literature, which emphasize that AI systems are most productive when their analytics are embedded in human AI complementarity rather than allowed to displace teacher agency (Dönmez, 2024; Marengo et al., 2025). In practical terms, the IRF pattern provided a conversational structure within which AI outputs could be questioned, contextualized, and connected to concrete improvement strategies.

AI, Academic Integrity, and Emerging AI Literacy

The discussions in Meeting 3 further indicate that integrating AI into public speaking instruction cannot be treated as a purely technical enhancement; it is also an ethical and epistemic issue. When controversial prompts about AI and academic honesty were used as initiations, students articulated both the affordances (easier access to ideas and language support) and the risks (temptation to outsource entire assignments, superficial learning) of generative AI tools. These responses suggest that students were already negotiating AI's role in their academic identity and were receptive to explicit guidance on responsible use (Yang et al., 2022).

Within IRF sequences, the lecturer's feedback not only clarified linguistic or content points but also re positioned AI as a tool that must be subordinated to understanding and personal voice. The juxtaposition of AI-generated text with AI-produced transcripts of students' own speech made these issues tangible: students could *see* and *hear* the difference between a "machine voice" and their own emerging rhetorical style. Thus, the combination of IRF based discussion and concrete AI artefacts appears to be a productive pathway for developing AI literacy in parallel with speaking skills encouraging learners to appropriate AI for reflective practice while resisting uncritical dependence on it.

Conclusion

This study explored how IRF patterns and an AI feedback tool are integrated in a university Public Speaking course. It concludes that:

1. IRF patterns were consistently employed and functioned as scaffolding for students' development from minimal responses to more structured, polite, and confident public speaking.
2. Feedback moves embedded in IRF ecasts, metalinguistic explanations, content elaboration, and affective support, played a key role in improving students' pragmatic appropriateness, organization, and delivery.
3. The AI Feedback Presentation application, deployed as a Hugging Face Space, complemented human feedback by providing automatic transcription and performance metrics that supported reflection but did not replace teacher judgment.
4. Integrating IRF with AI feedback created opportunities to address AI literacy and academic honesty explicitly, encouraging students to use AI tools responsibly while maintaining their own voice.

Suggestions

Further research could adopt a mixed methods approach, combining discourse analysis with larger scale AI log analysis. Future development of AI Feedback Presentation might include prosodic and pause analyses, provided that transparency, data privacy, and ethical guidelines remain central.

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