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Aligning Multimodal Smart Teaching Resources with Output Tasks in College English

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Abstract: Multimodal resources and smart learning platforms are now common in college English classrooms, yet topical relevance does not establish alignment with a learning goal, and a click does not establish language learning. This article examines a specific design problem: for a given output task, how can a teacher decide whether to retain, transform, or remove an image, text, audiovisual item, or platform function, and what evidence could support that decision? Using problem-driven integration of the literature and analytical instructional design, the study draws chiefly on the production-oriented approach to materials use, alongside multimodal discourse theory, multimedia learning, and research on technology integration. The article offers a design argument and an analytical illustration. The mechanism provides a reviewable basis for resource selection, process documentation, and subsequent empirical testing in multimodal smart teaching for college English.

Keywords: College English; Multimodal Smart Teaching; Resource Alignment; Production-oriented Approach.

1. Introduction

Smart learning platforms make textbook passages, campus photographs, university histories, short videos, voice recordings, polls, and automated feedback available in college English classrooms. As resources multiply, instructional choices become more complicated. For a task of introducing a university, a photograph, a history webpage, and a promotional video may convey spatial features, a historical sequence, and scenes of campus life, respectively. Alternatively, they may repeat the same information in different forms. If novelty or topical relevance determines selection, it is difficult to explain why a particular resource is needed. If viewing or click rates stand in for outcomes, it remains unknown whether students can introduce their university to international students in accurate and appropriate English.

Using the internet can increase students' motivation. The use of films in education can help students understand the material and develop their knowledge with greater enthusiasm. Students can use computers and the internet in their learning process to learn more effectively. Learning with technology can also help students develop higher-order thinking skills.

The use of teaching materials plays a crucial role in tertiary EFL education in China. Prior scholarship provides grounds for specifying output goals, adapting materials, interpreting multimodal meaning, and selecting technologies. The production-oriented approach (POA) treats input as serving communicatively meaningful output [14, 16]. Multimodal research examines the division of meaning-making work among semiotic resources [17]. Multimedia learning research suggests that extraneous material can consume limited cognitive-processing capacity [2]. Zhang [19] has used multimodal oral presentations in enabling instruction, while Sun [12] proposes principles for AI-enabled multimodal resource development in vocational English. A narrower issue remains for a college English unit with several candidate resources: how can the distinctive function of each resource be mapped to a learner transformation and observable language evidence, so that the grounds for retaining or removing it can be examined?

Here, resource alignment means selecting, transforming, and reviewing resources against diagnosed learning obstacles, modal functions, and evidence from an output task. Deep integration refers specifically to resources entering the learning activities required by the task and having a role that can be examined in students' output. The analysis concerns resource decisions at the college English unit level, and it does not infer an overall effect of smart teaching technologies. The central question is how to establish operational and testable rules for aligning multimodal smart teaching resources.

2. Theoretical Foundations of Resource Alignment

2.1. Output-Oriented Materials Use

The POA organizes instruction through motivating, enabling, and assessing, requiring teachers to work backward from the communicative task students must complete to the input and support they need [14]. In its framework for materials use, output goals govern the selection and transformation of input materials; evaluation concerns the appropriateness of those goals, the effectiveness of enabling activities, and goal attainment [16]. This establishes the first order of decision making: specify who communicates with whom, in what situation, and through what English product, then diagnose possible gaps in information, language, or audience awareness. Bi [6] further examines the dynamic teacher–student relationship in materials use. Fan [8] shows, through critical reading and writing, that selecting, adjusting, modifying, and adding materials should serve a particular competence goal. Jia and Shen [9], using teacher interviews and materials analysis, likewise indicate that rich textbook content may still require supplementation for language-development goals. Neither materials pushed by a platform nor existing textbook sections therefore automatically constitute this unit's instructional goals.

Wen's materials-use framework separates the rationale for selecting and transforming input from the criteria used to evaluate the ensuing instruction [16]. These unit-level

criteria are essential, but they do not by themselves identify what an individual photograph, timeline, or model letter contributes to a specific part of a student's work. Jia and Shen's evaluation from teachers' perspectives makes the distinction concrete: they describe rich content and varied enabling activities while also noting that language-ability objectives require further teacher attention [9]. Their finding concerns a different textbook, not the campus-letter task examined here. Read together, the two studies sharpen a smaller design question: which item helps learners turn verified facts about their university into an explanation an exchange student can follow? The five-link record is proposed to document this decision; it is not an empirical correction to either study.

2.2. Modal Complementarity and Cognitive Processing

Multimodal discourse analysis distinguishes complementary from noncomplementary relationships between modes [17]. Whether a photograph, motto, historical record, and audio recording complement one another depends on the information or action each affords for the current task, not simply on its medium. A campus photograph may show the actual environment, a university history may provide a verifiable timeline, and an English model letter may demonstrate how to address an international reader. Each can address a different difficulty. A video that merely reads the history already available on the university website, however, needs a further justification for its additional value. Fan and Li [7] discuss AIGC-assisted teaching with images and discourse; the usefulness of generated images still depends on authenticity, task relevance, and students' ability to explain their meaning. Mayer's [2] principles suggest removing irrelevant or unnecessary duplication. This cognitive rationale can inform a selection hypothesis, but it cannot establish in advance that a particular video necessarily causes overload or has no value.

Zhang's account of complementary and noncomplementary modal relations concerns how semiotic resources contribute to meaning [17]. Mayer's coherence and redundancy principles, by contrast, concern the processing demands of particular multimedia presentations [2]. A resource can therefore add a distinct kind of information and still be poorly timed for a brief letter-writing task. Conversely, a repeated fact may have a purpose if students use it to check an official claim or rehearse a useful English formulation. Neither account, on its own, decides whether the campus video in Table 1 should be retained. The proposed comparison is between what the video uniquely enables and the instructional time it displaces. Whether that comparison predicts students' subsequent information choices remains a question for classroom evidence.

2.3. Technology Integration and Learning Evidence

Technology is an important factor in improving the teaching and learning process in schools and universities, especially in English language teaching. It can help teachers present lessons more effectively. Technology is useful in education because teachers can use English-language videos, songs, movies, and even theatre performances in their lessons. Nowadays, the use of technology is common around the world.

These examples show what technology can bring into an English lesson, but they do not explain how a teacher should choose among the available resources. That choice depends on the language skills students need to develop, the activities in which they will use the resources, and the feedback they receive.

Technology integration requires attention to content, pedagogy, and technological conditions together [3]. Second-language research further asks how technology-mediated interaction, input, and feedback contribute to language development [1]. Stockwell [4] identifies the relationship between skill targets and technology choice as an issue in the computer-assisted language learning literature; Tomlinson [5] treats materials evaluation, adaptation, and use as connected practices. Chinese studies of staged enabling and teacher–student collaborative assessment offer methodological points of reference for phased support and feedback on student work [10, 11, 15]. Taken together, these studies position the platform as an environment for delivery, action, and evidence retention, rather than as a learning outcome in itself.

Sun's recent discussion of AI-enabled multimodal materials starts from vocational English textbooks and puts the instructional problem and likely effect ahead of the availability of a tool [12]. The present letter task shares that concern with purpose, but it places a further constraint on content: the motto, historical dates, and named achievements refer to an actual institution. An attractive generated image or an automatically supplied achievement would be of little use if its details could not be verified. Chapelle's account of technology and second-language acquisition asks researchers to consider how computer-mediated tasks alter learners' exposure to and interaction with the target language [1]. For this design, a platform log can establish that a resource was available; checking sources and tracing changes in the letter would provide more relevant evidence for its proposed role. This remains an evidentiary proposal, not a measured teaching effect.

These three strands address why students learn, how resources divide their work, and how a judgment can be supported. Output goals specify needs, multimodal analysis differentiates functions, and learning evidence tests whether a resource enters students' expression through an activity. Their connection is the analytical focus here: the alignment of an individual resource within a particular output task.

3. Research Design and Analytical Procedure

Technological pedagogical content knowledge (TPACK) aligns with the requirements for teachers' professional competence in China in the information era. It also provides a useful framework for Chinese teachers' professional development. This article is a theory-driven instructional design study. Its materials comprise the cited Chinese and international studies, resource types commonly found in college English textbooks and platforms, and an analytical adaptation of a textbook task. Literature was purposively selected around three questions: how output goals constrain materials, how modes complement one another, and how technology use can yield learning evidence. The procedure was to extract decision criteria from the literature; specify the task, anticipated obstacles, and candidate resources; document each resource's function, associated activity, and

expected evidence; apply deletion and substitution tests; and revise the mechanism in response to gaps exposed by this analysis.

Four questions constrain preference-based judgments. Does the output task specify an audience, product, information requirements, and language requirements? Which unresolved obstacle does a resource address? What will students extract, compare, reorganize, or express with it, beyond merely viewing it? What evidence in the product or process record could support its intended role? If students could complete the task to comparable quality under the specified conditions without a resource, its removal merits consideration. If a shorter or more accessible item performs the same function, substitution merits consideration. Both tests are design judgments, and actual classroom decisions would need revision in light of student evidence.

The case assumes first-year non-English majors in a college English course. The task comes from the Unit 1 Unit Project in New Horizon College English (Fourth Edition): Reading and Writing 1 (p. 27): write an English letter to an international exchange student introducing the campus environment, university motto, university history, and university achievements. To make resource decisions observable, this article sets an approximately 180–220-word final-letter target and requires at least one relevant, audience-oriented item for each of the four aspects. The word range is a design parameter of this article, not a requirement attributed to the textbook. Campus features, the original motto, the founding date, and named achievements must be checked against verifiable university sources, such as its official website or history archive. No institution-specific facts are invented here.

4. A Five-Link Framework for Resource Alignment

4.1. Output Goals and Learning Obstacles

The first stage, goal, reduces a broad aim to an observable unit product. In this case, the content goal is to select sourced information on each of four aspects—the campus environment, motto, history, and achievements—without piling up unverified promotional claims. The language goal is to connect them in an English letter with appropriate format, clear paragraphing, and accurate description and explanation. The communicative goal is to help an international exchange student who has not visited the university understand its distinctive features and their relation to study and campus life. The significance of the motto can be explained through concrete examples; a single writing task does not warrant a claim of changed values. When there are too many goals, the teacher should first choose two or three core performances to assess and consider whether the remaining goals are background or extensions.

The second stage, obstacle, begins with a task attempt. During motivating, a teacher could show a campus photograph and the verified motto, then ask students to draft an approximately 60-word opening to the English letter. Visible difficulties could be recorded under inadequate factual basis, difficulty organizing language, and weak audience awareness: merely listing building names, failing to explain the motto, making unverified claims about achievements, or omitting context an international student would need. The initial draft would diagnose obstacles in the actual class. Before instruction has taken place, this article does not claim that such problems occurred in any class.

4.2. Resource Selection and Functional Roles

The third stage, resource, builds a candidate list for each obstacle. Necessary means that without the information or support, a core task requirement would be difficult to meet under current conditions. Complementary means that two resources address different obstacles and require integration by students. Redundant means that an item repeats available information without addressing a new obstacle or enabling meaningful action or feedback. These are relative judgments that change with audience, proficiency, and task, and they are not permanent labels for media types.

Table 1. Candidate resources and preliminary alignment decisions

Candidate resource	Obstacle addressed	Learner action and expected evidence	Initial decision
Official campus photograph	Environmental description lacks specific visible detail	Select a facility or place and explain its relation to study or campus life in the letter.	Retain; verify location and present condition.
Official motto and historical sources	Meaning of motto and historical milestones are unclear	Verify the original motto and one milestone; explain them in English in the letter.	Select relevant excerpts and retain source details.
University achievements webpage	Names, dates, and significance of achievements are hard to verify	Choose one dated and sourced achievement; relate it to a distinctive feature of the university.	Retain one item; remove vague slogans.
Promotional video repeating website text	Information largely duplicates an existing written source	If it yields no new fact or explanatory use in the letter, its distinctive function is unclear.	Remove provisionally; reconsider if authentic scenes are needed.
Platform submission and annotation functions	Drafts, feedback, and revisions are difficult to retain	Keep time-stamped initial drafts, feedback, and final drafts.	Retain solely as recording and feedback tools.

Where spatial features are difficult to explain in words, a short video of the actual campus may provide environmental cues unavailable in a still photograph. Where the obstacle lies in expressing the motto in English or relating dates in university history, concise official text and language support may be more appropriate. Adding a ready-made promotional film solely because it exists may take time without supplying facts or expressions usable in a letter. The teacher should record what would be lost if the item were removed and check that prediction after actual instruction.

4.3. Resource-Based Enabling Activities

Unlike other instructional approaches for language learning, the POA starts teaching with language production and ends with production while input serves as an enabler to help accomplish productive activities. The term ‘production’ is used here instead of ‘output’ simply because it includes not only speaking and writing but also translation and interpreting. The fourth stage, activity, mediates between resource and output. A campus photograph should do more than appear on

screen: students select an environmental detail relevant to an international student's study or daily life and explain its significance in English. The motto and historical records should do more than provide text to copy: students verify wording and dates, summarize a milestone in the university's development, and explain the motto in their own words. A model should do more than invite reading: students identify its salutation, paragraph organization, and audience-oriented explanations, then apply these features to verified information about their own university. The sequence can move from verifying facts to selecting details, explaining meaning, and writing the letter. If students already retrieve accurate institutional facts, repeated presentation should give way to explaining the motto and achievements for international students unfamiliar with Chinese universities. Qiu [10] emphasizes staged language enabling. W. J. Zhang's [20] writing experiment found no significant between-group difference in total composition scores, although language-related dimensions and target items differed; L. L. Zhang [18] also reported nonuniform findings across listening, writing, and reading. Both studies caution against generalizing skill-specific changes to overall English proficiency.

The smart platform serves only needed functions: distribute sourced and dated materials on the campus, motto, history, and achievements; collect initial and final letters; annotate feedback; and preserve revisions. If oral peer review is faster and the essential evaluation record can be retained, a poll need not be added for the sake of digitization. Evidence of transformation into learning activity should include which institutional sources students used, how they reorganized information in English, and what they changed in response to feedback.

4.4. Learning Evidence and Resource Review

The fifth stage, evidence, separates process traces from learning performance. Logins, view counts, and submission times can show access and opportunity to participate; they do not show understanding. Letters can be analyzed for factual accuracy, clarity of expression, and audience appropriateness. Are the campus, motto, history, and achievement details sourced and free of factual errors? Do these four areas form coherent paragraphs for the purpose of introducing the institution, in comprehensible English? Do explanations meet an international student's need to understand the university's name, motto, and local context? Changes between initial and final drafts on the same criteria are closer to the proposed enabling mechanism than a one-time preference survey. Even if improvement is observed, it cannot be attributed to a particular medium without comparison and consideration of other influences.

The five links thus form a falsifiable chain: task requirements define obstacles; obstacles specify resource functions; activities bring those functions into expression; and evidence tests the initial judgment. If an item is viewed often but never appears in students' information choices or language revisions, its alignment should be reassessed. If removing it repeatedly obstructs a subgroup's expression, the item or a functional alternative should be restored. This feedback loop makes necessary, complementary, and redundant revisable classroom judgments rather than a fixed resource catalogue.

5. Analytical Illustration of the Campus Letter Task

It has become a hot topic in the field of education to improve teachers' teaching ability by using modern information technology. The knowledge possessed by teachers is the basis for teachers to carry out teaching activities. Its composition and structure will directly affect teachers' teaching behavior and students' learning outcomes. In the information and technology era, TPACK is the essential knowledge and key factor for teachers to integrate technology into teaching. Teachers are the real "magicians" in the integration process of technology and curriculum.

During the motivating stage, the teacher frames the situation as an international exchange student who wants to learn about the university before arrival. Drawing on the Unit 1 Unit Project's letter task, the teacher displays one sourced campus photograph and the verified motto and asks students to write an approximately 60-word opening independently. The number of displayed items does not indicate readiness; specific gaps in the first attempt do. If many students can describe a building but cannot explain the motto, official interpretation and explanatory language should receive priority in the next phase. If dates or names of achievements are inaccurate, source reliability and the timeline should be addressed first, perhaps with a concise chart.

During the enabling stage, pairs verify a campus photograph, the motto, a historical timeline, and information about achievements, then select details most relevant to an international student. They examine an edited model introduction letter and distinguish transferable letter structure from facts about another university that cannot be copied. The teacher probes transformation with two questions: "How would you explain the motto in one sentence, rather than provide only a literal translation?" and "What is the source for this achievement, and why is it worth mentioning to an international student?" Students outline paragraphs, draft the letter, and receive brief feedback on facts, organization, and expression. The photograph supplies spatial cues, history provides a temporal sequence, and the model supplies language and genre support. Their integration into students' own letters is what would constitute modal complementarity.

During the assessing stage, students submit an approximately 180–220-word final English letter and a brief revision note identifying at least one change prompted by source checking or peer feedback. The teacher chooses anonymized samples for teacher–student collaborative assessment against the three criteria published in advance [11, 15]. If a final letter fluently repeats the model but retains an incorrect founding date, the source-checking activity needs adjustment. If all four kinds of facts are present without explanation for an international student, audience-oriented questions and model analysis need adjustment. Assessment feeds the next resource decision instead of only generating a score.

What can transfer from this illustration is the decision sequence and recording format, not a fixed combination of campus photograph and model letter. Wang [13] proposes a framework for interdisciplinary competence in college English education that invites authentic problems and technology use into course design. The unit considered here, however, remains organized around assessable English communication. Institutional materials, student proficiency, and available time will alter the obstacles and resource

choices; the particular configuration should not be copied unchanged.

6. Discussion and Future Research

Computer-assisted second language research tasks require learners to work on the target language interactively with a computer program or with other people through the medium of the computer. CASLR tasks may appear to the learners to be a regular part of instruction or assessment, or they may be introduced to learners as research tasks . Such tasks are used in SLA research to (1) operationalize learning conditions so researchers can test hypotheses about SLA and (2) gather data that allow the researcher to make inferences about learners' knowledge and strategies.

Computer-mediated tasks can make learners' interactions and responses available for analysis. In classroom teaching, however, the availability of such evidence does not by itself show whether a digital resource helps learners meet a particular output goal. This distinction calls for a closer examination of what each resource enables learners to do and what evidence can show that the intended learning has occurred.

The article adds an account of individual resource functions and evidence tracing to the existing POA framework for evaluating materials use and research on multimodal teaching. Wen's [16] criteria—appropriateness of output goals, effectiveness of enabling activities, and goal attainment—address overall evaluation. The present mechanism additionally asks teachers to specify an obstacle, a transformation activity, and observable evidence for each candidate item, using deletion and substitution tests to constrain accumulation. It can explain when one campus photograph is preferable to a full promotional film and when a demonstration of real campus scenes has a function that a still image cannot replace.

A subsequent study could use iterative case inquiry across two structurally similar units in one class. Researchers could retain and document the existing resource decisions in the first unit and use the five-link record in the next, while documenting task difficulty, instructional time, initial proficiency, and teacher intervention. Data would include initial responses, classroom observations, resource-use records, initial and final drafts, short interviews, and a teacher decision log. Two raters could pilot an assessment rubric on anonymized work, revise it, independently score a subset, and report agreement. Coding of resource functions should also document disagreements and the reasons for revisions. The central analysis would trace whether an item addressed its previously diagnosed obstacle and where the expected change appeared in student work. Estimating a causal intervention effect would require more extensive instructional data and an appropriate analytic design.

7. Conclusion

The challenge of multimodal smart teaching in college English can be expressed as a concrete classroom decision: why should a particular resource enter a particular output task? Drawing primarily on the POA and incorporating modal coordination, cognitive processing, and technology integration, this article proposes a five-link mechanism of goal, obstacle, resource, activity, and evidence. It starts from an observable English product, selects or transforms resources according to actual obstacles, connects modes through students' reorganization of information and language, and reviews decisions against work and revision evidence. The example of writing to an international exchange student about one's university demonstrates how the mechanism can be applied. Its instructional effects remain to be tested in classroom research.

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