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# Constructively Aligned Instructional Design for Oral Presentations

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# Constructively Aligned Instructional Design for Oral Presentations

**Abstract:** The work described here was implemented at an R1 polytechnic University in New Jersey by the authors in oral presentation and senior seminar courses offered by the Humanities and Social Science department for engineers. To provide a coherent instructional design that can function in Face-to-face and online courses equally effectively, the 'General, Particular Specific' model[1] was piloted and is now fully integrated. This scaffolding for students enhances their critical thinking about content and alignment with the audience when examining content to be delivered orally to diverse groups. The students are taught to effectively communicate technical information as responsible experts.

## Introduction

Communication is essential in all career paths but many STEM students discount the value and avoid practice rather than embrace the need to improve this transferable essential skill and its importance on employability [1]. Employers stress the need for workers that are effective oral communicators and most programs assign oral presentations and reports as part of the curriculum. Interviews and job activities highlight the need for this skill at all levels.

However, there is a lack of research into effective instruction and assignment design. Moreover, explicit instruction is rarely provided with many faculty providing poor examples of best practices based on research "the lack of explicit instructions in scientific inquiry skills is a major factor in both low STEM retention and academic underperformance" [2]. Often it is assumed that students have been taught the needed skills already on how to understand an assignment, design an effective means for conveying a core message, and understand how to judge the scenario and goals aligned with the needs of the content and supporting materials.

Though this is often not the case, the support and feedback, if any is provided, cannot do more than refine the content delivery for a narrow situation which the instructor generalizes without providing the means to understand and apply the feedback to future tasks within the same class, other classes in the curriculum, or future needs within the field. Students need to have clear explicit instruction and emphasis on a scaffolded, constructively-aligned system for approaching oral presentations that begin with the student's current level and allow them to learn how to approach any scenario to integrate content with delivery to attain their goal of conveying their core message to the desired target audience within the prescribed scenario. This article presents a background of the "General Particular Specific (GPS) model" [3] with how it was used to develop constructively aligned tasks [4] to teach oral presentations.

The goal of this paper is to explain the elements of the curriculum instructional design that benefited from the use of the GPS model to enhance constructive alignment.

It starts with a theoretical framework and basic definitions for the present discussion. It follows with a background of the context. Then, the article describes the steps followed for developing instructions for effective oral presentations, leading to a description of the GPS model. This is followed by a real-world example of its use in teaching effective oral presentation design and the author's rationale for using the GPS model as a means of constructive alignment. Finally, the authors discuss the results of its use and conclude with limitations, next steps, and final thoughts.

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[1] The term *GPS model* will be use to refer to 'General, Particular Specific' model. The term *GPS model matrix* will be use to refer the 9-box matrix of the model.

## Theoretical framework

The following literature is used to consolidate the theoretical framework recommended for everyone interested in oral presentation and education.

1. A Framework for Marketing Management [5]
2. A New Vision for Center-Based Engineering Research [6]
3. A taxonomy for learning, teaching, and assessing: a revision of Bloom's taxonomy of educational objectives [7]
4. Building Capacity for Teaching Engineering in K-12 Education [8]
5. Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century [9]
6. Enhancing teaching through constructive alignment [10]
7. The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation [11]

## Basic definitions

### Curriculum-Based Assessment (CBA)

"Because of its foundation in relevant educational practice, CBA can be a highly useful tool in student evaluation and instructional decisions within a problem-solving framework" [11, p. 447].

**Curriculum and Instructional Design (CID),** encompasses the range of areas that deal with the organization of content to be taught along with the structure of methods and supports to accomplish that teaching. The curriculum describes those activities at a larger scope while instructional design deals with the planning and execution closer to the interaction with learners.

**Constructive Alignment (CA),** is the idea that the content, **Pedagogical Content Knowledge (PCK)**, methods of instruction and delivery, as well as assessments must all connect and reinforce one another. The CA provides a clear plan and a coherent path for learning aligned with the PCK. Additionally, the concepts being taught are reinforced for learners. Finally, it provides a picture of prior and future knowledge [4], [10], [12].

**The General Particular Specific (GPS) model**, is a deductive analytical tool designed to assist presenters in pre-planning and planning their oral presentations in diverse situations and contexts. The GPS model has a structure that can assist students to maintain focus on the purpose of the presentation by creating the broad topical categories of "General", "Particular", and finally "Specific" [3].

**The Universal Strategic Planning (USP) model**, was designed to assist researchers or a research team with a tool to collaborate and communicate with different stakeholders and audiences from organizations, and associations, both public and private. The model will create a graphic organizer similar to a logic model diagram with two added dimensions Pre-planning and Assessment [13].

**The production model: Prepare, perform, publish (P3) model**, was designed to aid students to understand activities typically encountered in oral presentations as well as the needed steps towards effective presentations to attain a goal for the desired target in a given situation [14].

## Background

Numerous models and methods for specific applications of oral presentations have been put forth in different scenarios across educational situations. Cristo Leon and Ma. Rosalia L. Sanchez developed the 'General, Particular, Specific' or GPS model in 2004 as a model to facilitate student presentations for STEM prototyping in the "Centro de Bachillerato Technologic: industrial y de servicios No. 13 (CBTis)" a technical high school in Xalapa, Ver Mexico.

It was utilized as a fundamental model for the"Dirección General de Educación Tecnológica Industrial y de Servicios (DGETI)" from 2004 to 2010. It was implemented at the state, national, and international competitions for prototypes and entrepreneurs. The model was then implemented in continual education courses for the "Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM)" from 2010 to 2015 as a model for oral presentations in the context of business and marketing research presentations. Finally, in collaboration with the "Collaborative for Leadership, Education, and Assessment Research (CLEAR)" at the New Jersey Institute of Technology (NJIT) the model has been put into practice as a tool to improve the communication of undergraduate students and the presentations of academic research posters at the university for graduate students and researchers.

This paper explores the use of the GPS model as a deductive analysis tool to assist presenters in pre-planning and planning their oral presentations in diverse situations and contexts. In this way, the learner has a simpler way of structuring both their ideas and the expert content to be conveyed. In addition, this scaffolding can be applied to the way the instructional materials are presented and the assignment described this allowing the students to see the alignment more fully. As students experience the common language provided by the GPS model, the instructional support for effective presentation can move beyond simply effective content coverage or clear speaking to a higher level of discussion around effective integrated presentations.

The research conducted on this instructional method is based on "Constructive Alignment" [10], which describes how the learning objectives, instructional materials, and assessments should be aligned to increase their effectiveness. This constructive alignment of these aspects of the learning process tied to the curriculum and instructional design allows learners a clearer picture of the path and enhances the benefit provided by clear feedback and formative assessment. The GPS model provides a common language across disciplines so that students can understand their work, comment upon the work of others, plan more effectively and have a baseline for discussion and critical analysis of both contents and the way it is presented.

## Developing instructions for effective oral presentations

Over time, the authors have explored the problem of how to effectively teach students to present effectively. Initially, a survey of assessments and rubrics paired with a series of literature reviews was undertaken to identify best practices. This was followed by the development of the article "Curriculum Instructional Design: Critical Learning Path and Constructive Alignment" [4]

leading to materials focused on the components of effective oral presentations. Though useful, this revealed other problems related to student understanding, preparation, and level of sophistication. This led to the creation of the "Prepare, Perform, Publish (P3) model" [14] and "Production model perspective" [15]–[18] that adopts the aspects of film and theater to describe the presentation as a performance that requires planning and preparation before the moment of delivery as well as work to understand areas that exist afterward tied to post-production and performance improvement. With the needed instructional materials, support, and a model to drive student awareness regarding the planning phases, a new problem was revealed. Students could apply the tools when given focused content to cover or when refining aspects of delivery that the educator or experts identified. However, without feedback to lead them, many presenters defaulted back to content coverage repeating what sources wrote or emulating lecture-style reporting of facts and details. This highlighted the need for students to understand the elements of scenario planning and how it tied to a "Universal Strategic Planning (USP) model" [19]. Adding these elements to the instructional design and support assisted the constructive alignment and enhanced student understanding and overall quality of the work.

With all of this in place, the current problem being addressed is the need for students to be able to digest content and present it effectively to diverse target audiences. The work currently being explored by the researcher relates to the disconnect identified between integrated presentation and the need for the planning of a coherent storyline. Despite clear assignment descriptions aligned with the instructional materials and assessments, students still needed support for planning content matched with different rhetorical situations dictated by the scenario. Shifting the onus from the instructor micromanaging the oral presentation toward the student taking ownership of what is to be presented led to a significant shift in what is described and assessed. Working to make the tools and models more universal meant that a model for content delineation and organization needed to be described in ways those students could use them to plan and perform their oral presentations. Though many types and styles of presentations exist, for a wide range of disciplines and classes, a descriptive reporting sequence is a good starting point both in written and oral presentations. IT allows instructors to define a general space and limit or expand the scope as desired. At the same time, how content is categorized and correlated is defined by the subject matter and parameters set by instructors and programs. To accomplish this support for the students, the GPS model has been adopted so that students have a backbone on which to build a simple storyline and add in needed signposting and support within any given scenario.

Bringing all of these components together will allow students to have both an easier way of starting any oral presentation and a clearer mechanism for demonstrating understanding of content and their level of ability to present. The common models provide educators a list of criteria both for content and delivery that may be used at very high-level general assessments or narrowly focused specific detailed analysis depending on the described scenario.

In the end, the presentations that are created should be able to convey a core message and attain a goal with a desired target in the given scenario. Though most effective for reporting or informing-type presentations, the GPS model and E-GOALS supported method of developing constructively aligned presentation assignments also applies to persuasive-style presentations. These tools also allow students to plan for varying levels of length and adjust more readily the amount of content and level of detail by mapping out the overarching structure of the topic area.

The GPS model was used to describe a set of meta criteria termed "Overall Effectiveness, Graphics, Orals, Alignment, Lucidity, and Synthesis (E-GOALS)" [20], which starts with the most

general sense of a presentation of any type and moves down through layers of connected descriptions to subsequent areas of interest related to understanding and unpacking the larger areas. E-GOALS used the GPS model to develop consistent language and hierarchies of language to structure the way criteria were described to make it clearer and more coherent for students. When applied to oral presentations, these criteria allow the students to have a clear planning tool, performance structure, and assessment schema. At the highest level, the overall effect has three areas (content, delivery, and integration) that are rated. Many students consider these and often look for coverage of content with a reduction of errors in delivery. By having students focus more on how content and delivery come together under integration, E-GOALS moves them towards the consideration of how to effectively communicate thief message to the target audience to attain a desired goal in the given scenario. This approach makes the resulting learning more than just a summative performance towards a transferable skill to be developed and honed over time.

E-GOALS has consistent levels so that each general component has within it a set of particular elements that in turn has specific areas. The supporting materials utilize these same "terms and common structural elements" [21] to allow students to understand how this alignment of concepts matches the alignment of their content to be delivered and the necessary laments and aspects of effective presentation applied to their work. For example, the component of Orals can be broken down into three elements of character, Diction, and Expression. Echo of these in turn has several specific areas to consider, for example, Diction is composed of Vocabulary, Word Choice, and Pronunciation. Each of these could be broken down further but that would move the focus to very narrow issues tied to individual presenters and scenarios like an accent or use of jargon. However, with the full structure in mind, students can better understand where tier issues may lie and how very general or narrow feedback connects to the overall structure of the presentation being made. The three layers of the GPS model give a landscape of understanding rather than spotlights of issues or islands of criticism

Furthermore, the GPS model assists with the constructive alignment of the curriculum and instructional design by providing an order to the content that is replicated in the instructional materials and the assessment via oral presentation even going as far as labeling aspects of content with the GPS model terms. The content can be delivered more effectively as the student learns about what is needed and sees how to present it more effectively. The GPS model allows for a clear horizontal and vertical articulation of ideas that flow as well as identified the breadth and depth of concepts as they are mapped out and explored This scaffolding for the students helps them see how concepts fit together. At the same time, instructors have an easier time highlighting when students lack a full understanding of content and are merely covering content from a source without full comprehension of how the concepts fit together or need to be explained to be understood. Based upon previous research by the authors and their colleges, the GPS model utilized here was piloted and tested, as discussed previously. The figures below show its application in the current scenario.

**Brief description of the GPS model**

The GPS model is structured under the "Competency-based student progress and assessment framework and the Information Age Paradigm of the Instructional Planning Design Theory" [11, p. 386] it focuses on the "Pedagogical Content Knowledge" [11, p. 983], [22]. The GPS model consists of a 3x3 matrix (Illustration 1) created with the General, Particular and

Specific sections, which integrates the ideas of the logical models [23], with the “Mind maps” [24], [25] as well as “Concept maps” [26], [27]. The matrix generates 9 sections, which are read in logical order from left to right and from top to bottom. In these 9 sections (or boxes) the concepts will be placed in order from the most general to the most specific.

**Illustration 1.-** GPS Model matrix.

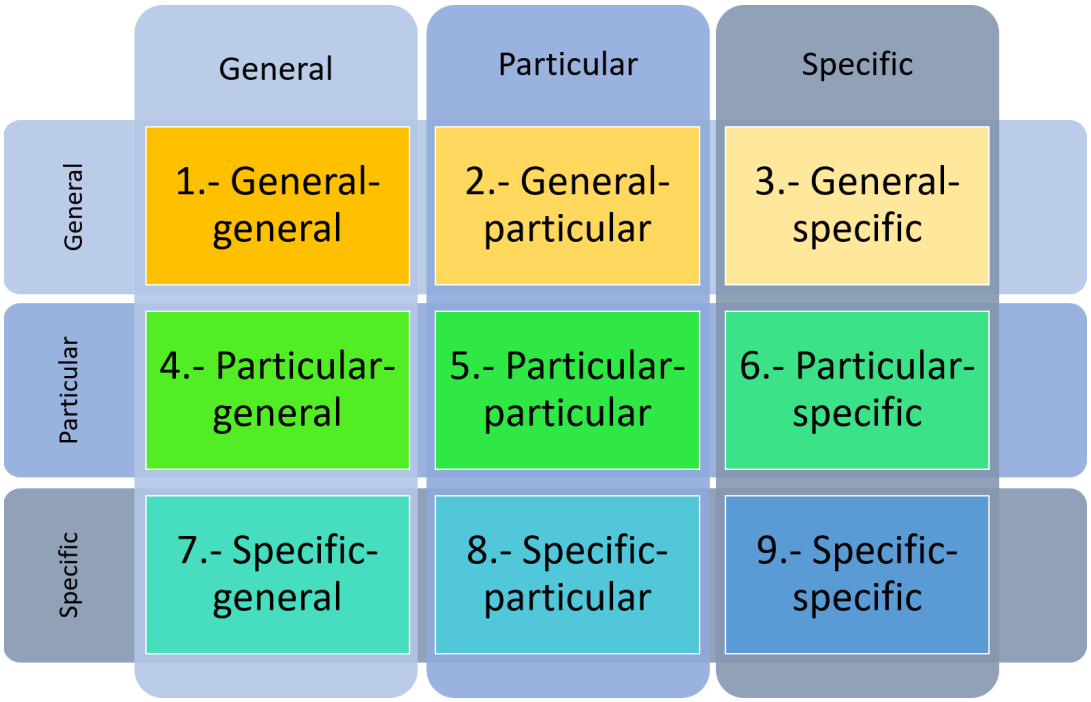


*Illustration 1.- General Particular Specific Model basic matrix created by Cristo Leon and Rosalia Sanchez.*

The content structure will assist students in developing a clear storyline for their content as it aligns with storyboarding and narrative.

**Using the GPS model to design a presentation**

The authors researched various aspects of effective oral presentations in STEM classrooms at a variety of levels as part of Curriculum and Instructional Design projects and research articles [29]. Part of this yielded the E-GOALS criteria [28] tested through a series of courses on oral presentation and then pilots in broader classes for Learning object design, and leadership and collaboration. Though the content was useful to students and supported learning of how to present effectively, students and faculty reported issues of student understanding.

When assignments required content analysis and digestion to demonstrate high-level thinking the students in upper-division courses showed improvement from the use of E-GOALS but asked repeated for similar instruction for content organization and support for understanding how to apply tools for planning effective oral reports. This led to the adaption and application of the GPS model to the course content to align the curricular structure, the instructional methods, the course materials, and aspects of the formative and summative assessments.

This was accomplished by organizing the work being delivered by the students into written and oral reports that contain descriptions at the General Particular and Specific levels. The materials to support these assignments were then provided so the GPS model is introduced and

explained in the concept of the E-GOALS criteria and written reports and essays. Finally, the rubrics for judging work were tied back to the assignment descriptions to make the wording parallel All of this was done to be able to explore if this model provided students with assistance in understanding content, structuring oral presentations, delivering content effectively, providing feedback and criticism to others, as well as understanding instructor feedback to apply it to subsequent tasks.

The use of the GPS model as a tool for designing oral presentations adds a new dimension to the model by adding the concepts of Define, Describe and Demonstrate on the X-axis and the concepts of Domain, Scope and Focus on the Y-axis (Illustration 2).

**Illustration 2.-** GPS Model example: From presentation to Pronunciation.

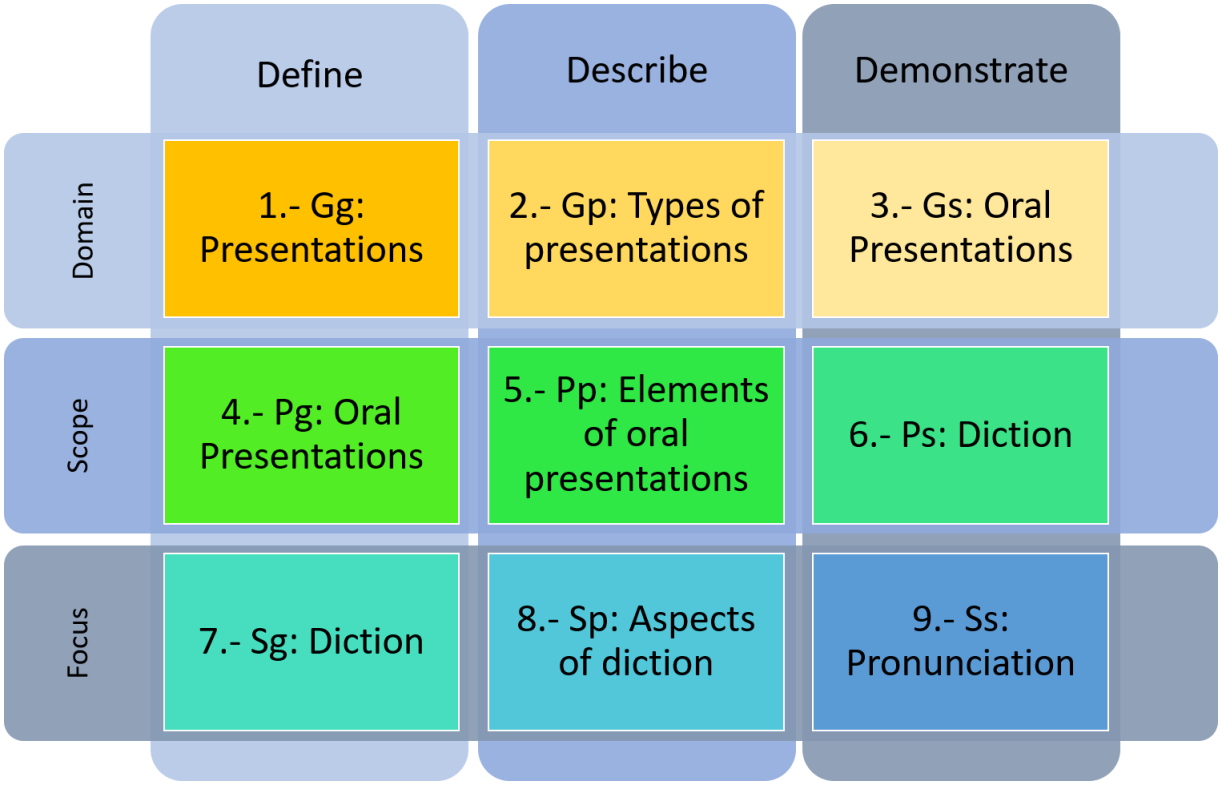


*Illustration 2.- General Particular Specific Model example: From Presentation to Pronunciation. Created by Cristo Leon and James Lipuma.*

In the present example, the designer is designing an oral presentation about Presentations (1), it will integrate the Elements of oral presentations (5) and conclude with Pronunciation (9).

The GPS model will then be structured on its 9 building blocks:

1.- General-general: Presentations. The Main domain that will be defined

2.- General-particular: Type of presentation. The description of the types of presentations

3.- General-specific: Oral presentations. The demonstration of the main domain 4.- Particular-general: Oral presentations. The scope will be defined

5.- Particular-particular: Elements of oral presentation. The description of the elements

6.- Particular-specific: Diction. The demonstration of selected element 7.- Specific-general: Diction. The focus will be defined

8.- Specific-particular: Aspects of diction. The description of the aspects

9.- Specific-specific: Pronunciation. The demonstration of the selected aspect

This is an oversimplified example of the application of the GPS model.

**Using the GPS model in Constructive Alignment**

The application of effective instructional design to the aims of the curriculum is augmented by the application of constructive alignment. Several different design approaches can be utilized but the need to align the way students' progress and mastery of content is measured and assessed, to align the instructional process major components should be presented with a common language and support one another through constructive alignment. Though different approaches may develop and implement the design in different ways, the result will produce a coherent collection of items tied to the descriptions of each task, delivery of lessons, and supports with the methods of assessment and feedback provided.

In the case of oral presentations, the E-GOALS criteria can provide a common set of metrics and instructional support for students. However, unless the course is about or related to presentations or other associated fields, this is only a supplementary collection of resources.

Thus, a more general tool for aligning the elements listed above were tested. By using the GPS model to overlay the five aspects of instructional design and match that to the GPS model for E-GOALS, the constructive alignment of the modular design of lessons and learning objects reinforces the work of students and enhances both their understanding and ease of access and learning.

For example, when assigning an oral presentation, the content to be delivered is mapped to a GPS model to allow students to have a scaffolding that matches the lessons. In this way, they are required to define a domain, describe a set of categories/options, and finally demonstrate "*depth of knowledge*" or application of one of those described options that must tie back to the original domain. When teaching the content, similar hierarchies are brought out and the model structure is highlighted in the requested presentation performance. These same terms are then used when providing feedback on the presented content as well as with the metrics used to rate and help improve the performance of the student.

For the senior seminar course being examined, the presentation task content was

designed with the use of the GPS model as a content mapping tool. Instruction was provided on the GPS model, supporting instructional materials were given online, and a small low-stakes presentation was assigned focused on the delivery of a simple GPS model matrix assessed with the E-GOALS criteria. By reviewing the criteria, an example of the GPS model to illustrate content mapping and layers of specificity was provided to students. The assessment in the form of an oral presentation required the presentation of content in the GPS model matrix.

This allows the assessment of the varying levels of content knowledge and effective presentation as the student defines the General (G) domain, describes in detail the Particular

(P) categories identified and then demonstrates the Specific (S) depth of knowledge within one of does categories. The student will then conclude the presentation by connecting the specific area back to the general domain.

Feedback provided on content was matched with delivery feedback in the same language of the levels of the GPS model using the terminology from E-GOALS.

As students work to develop an effective storyline and presentation content, they adopt the labels for the increasing degree of specificity to allow different domains to discuss content issues and organization in the common space. Reading the GPS model with the series of nomenclature allows translation of content into a more easily delivered and discussed common set of boxes and leading statements. This aids students to communicate their ideas and helps assessments identify issues in the structure and organization of the content as well as possible issues in the understanding of relationships between and among content items and levels.

For example, by reading down the first column of the 9-box GPS model matrix a student can easily describe the domain they are defining for their overall content, then move the particular scope of work for this topic and move to a specific area of interest for the current discussion. Though any terms may be applied as appropriate to the field, these simple scaffolds have been reported by students to provide students a means to more clearly express content as they prepare presentations. Similarly, the language prompts provided across any row assist students to organize thoughts and have a means of adding signposts and structures to the oral presentation. If describing the scope of work, for example, they can begin by defining the particular project scope, move to the set of tasks to be accomplished ND then demonstrate their understanding of one of these at a time teeing them back to the main topic of the scope of work or even to the larger domain. Another major benefit is the ability to map sets of nested groupings or categories that may pose issues for students to effectively communicate. Though any concentric set of terms can be used, the E-GOALS and GPS model adopted the three layers of components, consisting of particular elements each described by specific aspects. In cases where the subject matter dictated different names, those can be easily substituted. In addition, if more layers are required, they can be added. For example, the E-GOALS components are part of the larger set of categories; those are areas of overall effectiveness. Similarly, the specific area of pronunciation may have several factors for the aspects that comprise that element of diction.

In addition, this use of the GPS model provides students a better sense of the size of the steps they are taking as they map content for a presentation. At first many students, face issues due to having too many rows or jumping too many levels without considering issues tied to the scenario for the target and the time or other situational limits.

By the end of the semester, students are more prepared to create and effectively deliver an oral presentation. The organized content with the scaffolded terms also provides other students with simpler ways to share and critique work outside their narrow band of expertise or

training. This is especially useful when students are working in-group projects or on similar tasks in which presentations are, a developmental step along the path to a larger final written project report or final performance built upon other previous iterations.

## Rationale and results

For educators interested in assigning oral presentations combining the GPS model and E-GOALS will allow students to have a structured approach to organizing content. By having a constructively aligned instructional design, students can plan the presentation more effectible and know the areas of knowledge that will be judged.

Each scenario presents its unique parameters so drawing out the key aspects at an appropriate level of focus is essential. A major benefit of the GPS model is that it reduces the ad hoc nature of oral presentation assignment decryption while at the same time clarifying what is expected and how it is to be measured. In addition, within the course, students could easily provide feedback [30] by utilizing the E-GOALS criteria for discussion of the aspects of the presentation and asking questions related to the levels of the GPS model to better understand and discuss the content. Moreover, as the class word was tougher, student-to-student interactions adopted the terminology when discussing their work without specific direction from the instructor.

The application of the GPS model is limiting based on the scene in which the course is designed. At times, the content being covered or the style of presentation requires a different structure. However, for most general reporting designed to allow students to practice oral presentation, demonstrate content mastery, and elicit class discourse, the GPS model provides a strong scaffolding structure for the erection of a constructively aligned instructional design. The existing materials for E-GOALS allow students to have access to a clear description of complemented components, elements, and aspects of the effective practices that should be considered. When paired with the GPS model, content and delivery are more easily integrated.

One drawback that the GPS model has relates to limits on student understanding and willingness to move away from content coverage. Until it is widely adopted, the steps of a three-box GPS model matrix lead to the undemanding of the interim content descriptions are necessary. Novice presenters had difficulty grasping the sophisticated application of the fully articulated model. Students that were less confident in both content and delivery, defaulted back to reading source materials or duplicating the way information was presented.

GPS model style presentations are best suited for reporting or explaining topics, Arguments that naturally fall into a “set of claims” [31] with arguments and evidence along a line of thought also work well. When applied to open sales or pitches, the GPS model is applicable but less proficient students show more difficulty in applying it to structure content and enhance effective delivery. Much of this appears to be related to the level of knowledge and experience of the students as well as the length and depth required by the presentation scenarios each presenter finds him or herself within.

## Conclusion

In conclusion, the authors believe that communication is essential in all career paths. Education needs to improve the tools needed to achieve a better outcome for this transferable essential skill. In collaborating with a transdisciplinary approach, the authors included

employers, educators, students, and multiple organizations in the STEM ecosystem that require effective oral communicators. Future research is needed to identify key factors necessary to facilitate the integration of the GPS model with the syllabi of engineer STEM classes, as well as the impact and implications of aligning this tool and integrating it into the instructional design in Face-to-face and online courses.

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