Lowman's Model Goes Back to the Movies

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Abstract

Lowman's Two Dimensional Model of Effective College Teaching identifies traits of successful teachers and presents these traits in a functional framework useful as a tool for improvement. While the model is effective at outlining a mechanism to move towards status as a "Complete Exemplar," the categories of the model are broad, subjective, and can be difficult to precisely identify. Through development of a rubric, this paper seeks to improve educators' understanding of Lowman's model by sharing a series of examples. Teachers in contemporary movies and television are identified to represent several of the nine cells within the two-dimensional model. A previous paper provided an initial assessment of several famous actors portraying teachers. However, the examples in this previous paper are becoming dated and an updated paper with more contemporary examples may be useful for faculty attempting to better understand and apply Lowman's model. The contents of this paper first introduces the reader to the Lowman Teaching Model and provides support of the model through discussion of related literature. Development of the rubric is explained and the plot thickens as a series of characters are assessed with the rubric. As the curtain falls, a summary of the assessment and recommendations for use of the rubric are shared.

Setting the Scene – An Introduction

The purpose of this paper is to simplify understanding of Lowman's Two Dimensional Model of Effective College Teaching[1] and provide a method of assessing an instructor's style of teaching according the model. As evidenced by numerous references on the matter, defining effective teaching is not a straightforward exercise. The American Society of Civil Engineers (ASCE) Excellence in Civil Engineering Education (ExCEEd) Teaching Workshop recommends Lowman's model as a method of assessing effective teaching[2]. Lowman defines two dimensions to effective teaching: Intellectual Excitement and Interpersonal Rapport[1]. Intellectual Excitement includes components such as technical knowledge of the subject matter and clarity of presentation. Interpersonal Rapport contains interest in student learning and in students as individuals.

Estes and Welch[3] used teachers from movies and television shows to ease understanding of Lowman's model. However, some of the movie and television examples are becoming dated and do not resonate with new faculty. Additionally, determining one's place in Lowman's model remains difficult. As evidenced by the authors' experience writing this paper, debating where an individual sits in a category, while entertaining, is not a simple task. This paper describes development of a rubric to assess teaching in both of Lowman's dimensions and applies the rubric to contemporary movie and television teachers.

In this paper, the authors present a summary of Lowman's Two Dimensional Model of Effective College Teaching[1]. Next, development of a rubric to assess which style of instruction best describes an instructor is presented. The rubric is applied to several contemporary teachers from television and movies in order to demonstrate its use. Finally, recommendations are presented for applying the method and tools to self- and peer-assessment.

Flashback – Summarizing the Background

There is a vast body of literature dedicated to effective teaching, student learning, and teacher improvement. New and experienced faculty alike can benefit by learning and practicing basic teaching skills, interacting effectively with students, and seeking continual development[4,5,6,7]. Fink et al. have indicated that effective engineering teachers understand both content and pedagogy, and that faculty need a systematic way for continual educational development[8]. New faculty especially benefit from a formal process of being taught how to effectively teach and then practicing these elements[9,10,11]. New faculty should further look inward to recognize what improvements they can make to enhance their teaching effectiveness[4,6].

One specific study that has inspired each of the authors of this paper to become more effective engineering teachers is the Two-Dimensional Model of Effective College Teaching developed by Joseph Lowman[1]. This model is based on the idea that the most effective teachers focus on creating relationships and emotions that stimulate and motivate students to learn. The remainder of this section provides a brief summary of this model and its development as described by Lowman[1]. To develop this model, Joseph Lowman analyzed nominations for teaching awards over a three-year period at the University of North Carolina at Chapel Hill. Over five hundred nominations, predominantly coming from undergraduate students, were used in the study. All adjectives or descriptive phrases used to describe the nominees were reduced to a single form (e.g. enthusiasm coded as enthusiastic), and all descriptor words appearing at least ten times were selected for further analysis. From there, Lowman concluded that there are two principal components that affect effective college teaching: Intellectual Excitement and Interpersonal Rapport.

The first dimension, Intellectual Excitement, is comprised of what the instructor presents (i.e. the clarity of the presentation) and how the material is presented (i.e. generating emotional impact). Instructors with high Intellectual Excitement tend to be extremely clear and exciting, are well organized, able to present material clearly and in an engaging manner, maintain high energy, and appear to love presenting the material. It is important to note that the emphasis is on stimulating emotions associated with intellectual activity. This includes helping students find excitement in considering new ideas, understanding and appreciating abstract concepts and their application in the world around them, and participating in the process of discovery. Lowman notes that this is the more important of the two-dimensions of his model.

The second dimension, Interpersonal Rapport, deals with the interpersonal interaction occurring both within the classroom and without between instructors and students. Instructors with high Interpersonal Rapport are warm and open in their interaction with students and highly student centered. Although establishing a solid relationship between the instructor and student is important, there is an equal element of helping the student establish a solid relationship with the material. Both types of relationships can be achieved by encouraging students to be creative and independent in their learning efforts, encouraging students to ask questions, and maintaining a strong interest in the students as individuals and their feelings about the material. Interpersonal Rapport is as much about promoting positive emotion as it is about avoiding the stimulation of negative emotion. As noted previously, although the development of Interpersonal Rapport is one of the two key elements of the model, Lowman indicated that it is not nearly as essential to outstanding teaching as developing Intellectual Excitement.

Lowman's Two-Dimensional Model of Effective College Teaching was developed by combining Intellectual Excitement (IE) and Interpersonal Rapport (IR) into a three-by-three matrix where each element is rated as low, moderate, or high. Figure 1 shows Lowman's Two-Dimensional Model, and includes each of the corresponding terms used to identify the different teaching styles encountered and a brief description about the teaching capabilities of that teaching style. Although the model seems to compartmentalize these different styles, it should be noted that each axis is really simply a representation of a spectrum for which instructors develop these skillsets. Lowman acknowledges an assumption that it is more likely that teachers actually fall within a normal distribution along each of the axes; in essence then, most experienced teachers fall within the "Competent" range.

	Low Interpersonal Rapport	Moderate Interpersonal Rapport	High Interpersonal Rapport
High Intellectual Excitement	6. Intellectual Authority: *outstanding for some students and some classes but not for others*	8. Exemplary Lecturer: *especially skilled in large introductory classes*	9. Complete Exemplar: *excellent for any student and situation*
Moderate Intellectual Excitement	3. Adequate: *minimally adequate for many students in lecture classes*	5. Competent: *effective for most students and classes*	7. Exemplary Facilitator: *especially skilled in smaller, more advanced classes*
Low Intellectual Excitement	1. Inadequate: *unable to present material or motivate students well*	2. Marginal: *unable to present material well but liked by some students*	4. Socratic: *outstanding for some students and situations but not for most*

Figure 1. Two-Dimensional Model of Effective College Teaching (after Lowman[1]).

The progression of different styles is based on the idea that Intellectual Excitement is more important that Interpersonal Rapport (see numbering scheme showed in Figure 1). Thus, a teacher seeking to become more effective will climb Lowman's model faster by focusing first on intellectual excitement. However, both elements are necessary to become exemplary instructors. "Inadequate" teachers possess both low IE and IR, and really do not belong in the college engineering classroom. The good news is that for those who have not yet achieved "Complete Exemplar" status, climbing Lowman's model is a matter of education and effort. Note that both of the "Socratic" and "Intellectual Authority" types are actually outstanding for some students and situations, but not for all. "Socratics" are great for promoting independent learning, but struggle with lecturing. On the other hand, "Intellectual Authorities" are able to connect with confident independent students, but unable to provide adequate connections for students needing more of a personal touch. As indicated previously, most experienced college teachers are probably "Competent."

Although achieving the "Complete Exemplar" ought to be a teaching aspiration, Lowman further notes that exemplary instructors are also identified as teachers who excel at one of the two dimensions and are at least adequate in the other. The emphasis for "Exemplary Lecturers" is on motivating students through their passion for the subject matter, and these teachers are especially skilled within large introductory classes. On the other hand, the focus for "Exemplary Facilitators" is on relationships and inspiring high quality independent work. These teachers are especially skilled within small more advanced classes. Some students will naturally respond to one type of teacher over the other. The "Complete Exemplar" is a teacher that is able to modify the instructional approach to motivate all students, regardless of course level or class size. Lowman indicates that this type of instructor is rare, but has the distinct advantage of being excellent for any student and situation. The crux of Lowman's work is that all students will learn more effectively from and prefer college teachers in these exemplary cells. Therefore, all of us should aspire to improve our Interpersonal Rapport and Intellectual Excitement to at least exemplary status, as we strive to become "Complete Exemplars." The remainder of this paper discusses how instructors can apply the model and increase their own teaching effectiveness.

Character Development – Making a User-Friendly Rubric

One of the principal elements of this project was to develop a rubric to provide an effective way for instructors to understand where they fit within Lowman's model, as well as identify specific areas for improvement. In essence, to increase teaching effectiveness, one simply need increase in Intellectual Excitement and Interpersonal Rapport. However, that task alone is vague. The purpose of this research was to provide a more systematic approach to identifying specific key elements of Intellectual Excitement and Interpersonal Rapport to focus on improving, and began with development of a rubric for Lowman's model.

The first step in developing the rubric was defining characteristics of good teaching. During Lowman's research, 39 different common descriptive adjectives associated with effective teaching were identified and separated into four categories[1]. These included 16 descriptor words in the Intellectual Excitement dimension, 17 in Interpersonal Rapport, two describing Commitment to Teaching, and four General Positive Descriptors. Interestingly, Lowman also tested how many of these descriptors were on average associated with very poor, average, or very good teachers. The results indicated that there were on average 3.5, 12.3, and 25.7 of the 39 Lowman descriptive adjectives associated with very poor, average, and very good teachers, respectively[12]. In other words, there is a significant difference between the number of descriptors associated with each of these three categories of teaching effectiveness. Ideally then, one would work to increase effectiveness across 39 different elements of teaching. However, assessing teaching effectiveness across this many elements is daunting and doesn't provide a practical level of focus for improvement.

As many of the descriptor words were similar, a qualitative approach was taken to generate ten main categories for the rubric. All other Lowman descriptor words fit somewhere within these main categories. For Intellectual Excitement, Engaging, Knowledgeable, Organized, Clear Communication, and Commitment to Teaching were chosen as the principal categories. For Interpersonal Rapport, key categories were Caring, Available, Personable, Understanding, and Challenging. Some Lowman descriptor words fit into more than one category. For example, engaging is a main category. However, one must be knowledgeable about a topic in order to be

engaging. So engaging appears as an example of characteristics in the knowledgeable category. Additionally, being engaging is a key component in good communication and demonstrates a commitment to teaching, so engaging is listed in those categories as well.

The authors also consulted other resources providing general teaching advice to a higher education audience, avoiding texts with specific focuses (i.e., active learning, on-line education, etc.). Svinicki and McKeachie[4] separate their book into seven parts that generally correspond with the Lowman rubric categories. Similarly, Wankat and Oreovicz's[5] 17 chapters and Jahangiri and Mucciolo's[6] six chapters also provide material consistent with the Lowman rubric categories. Table 1 shows the general correlating information between Svinicki and McKeachie[4], Wankat and Oreovicz[5], and Jahangiri and Mucciolo[6] and the Lowman rubric caterogies. Similarities between these four references demonstrate that the rubric's categories are consistent with the current state-of-knowledge on effective college teaching.

Table 1. Link between Svinicki and McKeachie's[4], Wankat and Oreovicz's[5], and Jahangiri and Mucciolo's[6] chapters and Lowman's[1] descriptor words.

Lowman's[1] Descriptor Word	Svinicki and McKeachie's[3] Chapter	Wankat and Oreovicz's[4] Chapter	Jahangiri and Mucciolo's[5] Chapter
Engaging	5, 6, 12, 14, 15	5, 7	3
Knowledgeable	6, 23	3, 4	3
Organized	2, 6	3, 4, 6	4
Good Communicator	12	6	5
Committed to Improving	23	16, 17	3, 4, 5
Caring	13	10, 13	3
Available	12	10	3
Personable	11, 12, 13	10	3
Understanding	11, 12, 13	10, 13	3
Challenging	11,	5	3

After determining the five key rubric categories in both Intellectual Excitement and Interpersonal Rapport, the authors experimented with several scoring methods through assessment of teachers in television and movies, as described in the following section. A simple design, showing a

teacher's performance in each area as positive, neutral, or negative, proved the most effective. A numerical value of +1, 0, and -1 correspond to positive, neutral, and negative performance, respectively, in each area. Accordingly, the rubric results in a score between -5 and +5 in both of Lowman's dimensions. The resulting rubrics for Intellectual Excitement and Interpersonal Rapport are shown in Tables 2 and 3, respectively.

The final step in developing the rubric was determining how the numerical score corresponds to Lowman's styles of instruction. The authors performed an exercise similar to that described by Estes and Welch[2] using teachers portrayed in television and movies. As described in the following section, applying the rubric to example teachers allowed the authors to determine a numerical scale generally corresponding to breaks between Lowman's styles of instruction. The difference between styles of instruction is not as neat as Figure 2 implies. The rubric provides a guide as to which style best describes an individual teacher, but the numerical value from the rubric does not carve the result in stone. To emphasize this point, Lowman's styles of instruction[1] are shown somewhat transparent in Figure 2.
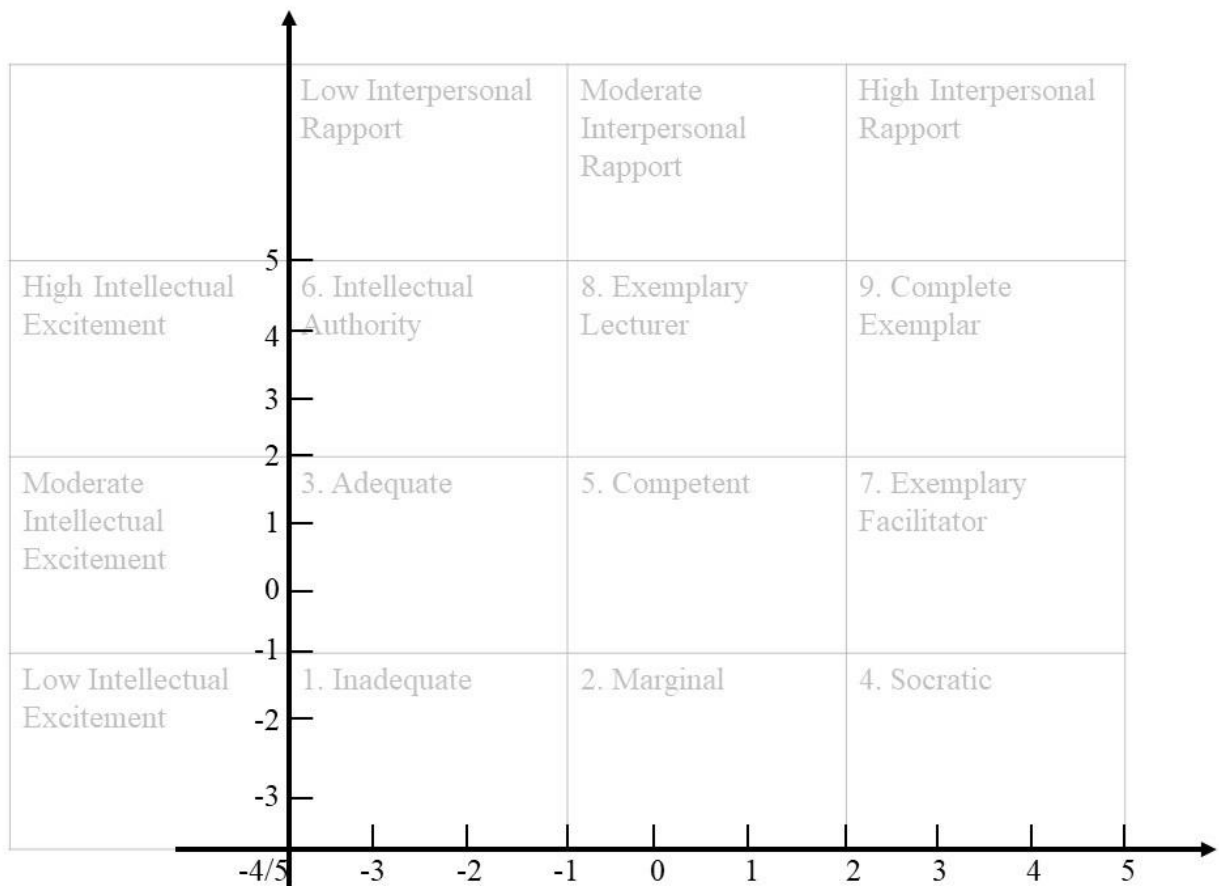

Figure 2. Applying the rubric's numerical values to Lowman's[1] styles of instruction.

Table 2. Rubric for assessing Intellectual Excitement.

	Engaging (enthusiastic, inspiring, humorous, interesting, exciting, energetic, fun, stimulating)	**Knowledgeable** (inspiring, interesting, clear, engaging, stimulating, lectures well)	**Organized** (clear, prepared, lectures well)	**Good Communicator** (interesting, clear, engaging, creative)	**Committed to Teaching** (enthusiastic, knowledgeable, engaging, creative)
Positive +1					
Neutral +0					
Negative -1					
SCORE FOR EACH CATEGORY					
TOTAL INTELLECTUAL EXCITEMENT SCORE					

Table 3. Rubric for assessing Interpersonal Rapport.

	Caring (concerned, interested, respectful, encouraging, motivating)	**Available** (accessible, helpful, patient)	**Personable** (concerned, caring, friendly, approachable, interested)	**Understanding** (accessible, respectful, fair, motivating)	**Challenging** (demanding, motivating)
Positive +1					
Neutral +0					
Negative -1					
SCORE FOR EACH CATEGORY					
TOTAL INTERPERSONAL RAPPORT SCORE					

The Chase Scene – Rubric Application to Movie Teachers

For the purpose of demonstration, assessment of various movie and television characters was performed according to the newly developed rubrics. Characters were selected with the intention of capturing behavior scattered across Lowman's styles of instruction[1]. This serves two purposes in both testing the rubric across teachers anecdotally spreading the Lowman spectrum, but also providing a background to those less familiar with Lowman's model.

The teachers were selected based primarily on the anticipated match to Lowman instructional styles[1] and the likelihood that a video clip was publicly available or easily accessible through basic subscriptions such as cable television or popular, legal video streaming services. Table 4 summarizes the selected characters which are intended to serve as demonstrations of the assessment process and increase familiarity with Lowman's Model.

Table 4. Movie and television characters assessed in this exercise.

Character	YouTube® link	Time in Movie/Episode	Explanation
Cooper Anderson – Matt Bomer's character in Glee	https://www.youtube.com/watch?v=A5ChxA7GGa8	Various 'in the choir room' scenes throughout Season 3, Episode 15	Cooper is giving questionable tips about "the biz" while clearly connecting with his audience (except his brother).
Sheldon Cooper – Jim Parson's character in The Big Bang Theory	https://www.youtube.com/watch?v=hm87ZLMMFss	Beginning of Season 2, Episode 6	Sheldon is supposed to introduce theoretical physics to potential majors, but insults their potential and discourages them without providing any substantive information about his topic.
Alison DiLaurentis – Sasha Pieterse's character in Pretty Little Liars	https://www.youtube.com/watch?v=mkKJAUpRI9M	Beginning of Season 6, Episode 11	Alison is reading aloud to a class full of attentive students, but loses track of time and seems to be in her own world.
Dewey Finn – Jack Black's character in School or Rock	https://www.youtube.com/watch?v=37oJqWp4rJM	~15 minutes into the movie	Dewey is pretending to be his roommate, a substitute teacher, to make some easy money. He does not want to teach or even be in the classroom.

Mr. Feeny – William Daniels' character in Boy Meets World	https://www.youtube.com/watch?v=4_W6r_APrbY	Opening scene and classroom scenes throughout Season 1, Episode 1	Mr. Feeny is dealing with discipline issues in his classroom while teaching Cory specifically about Romeo & Juliet but more generally about love & life.
Master Shifu – Dustin Hoffman's voice in Kung Fu Panda	https://www.youtube.com/watch?v=nb8mV2z6k9Y	~19 minutes into the movie	Shifu has serious doubts that his new student, Po, belongs. However, he is committed to carrying out his duty to teach him. His training is well organized and complete, but laced with discouragement.
Severus Snape – Alan Rickman's character in Harry Potter and the Sorcerer's Stone	https://www.youtube.com/watch?v=r8i2jAMtoGw	~50 minutes into the movie	In Snape's first potion lesson to first year students, he quickly establishes his expertise in and the necessity of his topic. However, he is not at all friendly or welcoming.
Yoda – Frank Oz's voice in Star Wars: Episode II – Attack of the Clones	https://www.youtube.com/watch?v=G67eMq1YwmI	~35 minutes into the movie	Yoda is teaching a class of younglings how to use a lightsaber when Obi Won interrupts with a question. Yoda asks his class for help solving the mystery and they find the solution.

Application of the assessment process is intended to be straightforward, in that an assessor can simultaneously view a video example of a character teacher and compile both short notes and a score for all categories presented in the rubric. Many characters' experience changes throughout a movie or television series. Therefore, the assessor should be mindful of the immediate example and avoid tendencies to manipulate the results based on knowledge outside of the particular clip.

For brevity's sake, this paper only describes one assessment in detail. Table A1 (appendix) shows assessment of Yoda's instruction in Attack of the Clones in terms of Intellectual Excitement. Yoda is engaging and knowledgeable. He stimulates student thinking through questioning and is clearly an expert on his topic, using the Force to guide problem solving. Additionally, Yoda is obviously committed to teaching, enjoying his job ("truly amazing, the mind of a child") and accepting student feedback that spells trouble for him and the whole Jedi

Order. Yoda earns positive scores in each of these areas. The authors agreed that Yoda's organization was neutral. While having a clear lesson plan that captured the attention of so many very young students is impressive, allowing Obi Won to interrupt is a significant, if important, distraction. The authors disagreed on how to assess Yoda's communication. While clearly engaging young students at a level they could understand, "Yoda speak" is confusing to many. Ultimately, the largest Star Wars nerd among the authors insisted this not count against Yoda and assigned a positive score. However, the debate highlights that different students view the same actions differently. Thus, one's place in Lowman's Model is not written in stone.

Yoda's Interpersonal Rapport assessment is shown in Table A2 (appendix). Here the authors unanimously assigned Yoda positive marks. His care for students is clear in his involvement of them in his appreciation for their thinking process. Yoda is so available that older students, Obi Won in this case, feel comfortable interrupting class. His joking and laughing make him a very personable instructor. He challenges very young students by asking them to help solve a problem that a Jedi Master could not solve, demonstrating respect that points to his understanding of his students. Overall, the authors assigned Yoda a score of +5 in Interpersonal Rapport and +4, with some debate, in Intellectual Excitement.

As presented in Table 5 and Figure 3, a series of characters were identified, rubrics were completed, and scores were compiled graphically to categorize the characters based on the Lowman scale. As shown, the characters span across both the intellectual and personal rapport scales that align with the Lowman teaching types. While this list is not exhaustive, it can be seen that the examples presented capture behaviors that can be mapped to teaching strategies that are demonstrated to improve teaching effectiveness according to the Lowman strategy.

Table 5. Results of the author's assessment of television and movie teachers.

Character	Intellectual Excitement Score	Interpersonal Rapport Score	Lowman style of instruction[1]
Cooper Anderson	-1	4	Socratic
Sheldon Cooper	-4	-5	Inadequate
Alison DiLaurentis	-1	0	Marginal

Dewey Finn	-3	-5	Inadequate
Mr. Feeny	1	0	Competent
Master Shifu	3	-4	Intellectual Authority
Severus Snape	4	-4	Intellectual Authority
Yoda	4	5	Complete Exemplar

The Moral of the Story – Recommendations for Use at Your Institution

The intended value of the rubric presented is to serve as a tool for both self- and peer-assessment in the professional development of engineering instructors. It is recommended that the rubric be reviewed along with the fundamental concepts of Lowman's Instructional Strategy[1] as the purpose here is not to promote the rubric itself, but to embrace the Strategy as a mechanism to improve effective teaching performance. To apply the lessons of Lowman to the use of the rubric, readers are encouraged to use Tables 2 and 3 on favorite teachers from television, movies, or your student experiences as a means to increase comfort with Lowman's Model[1].
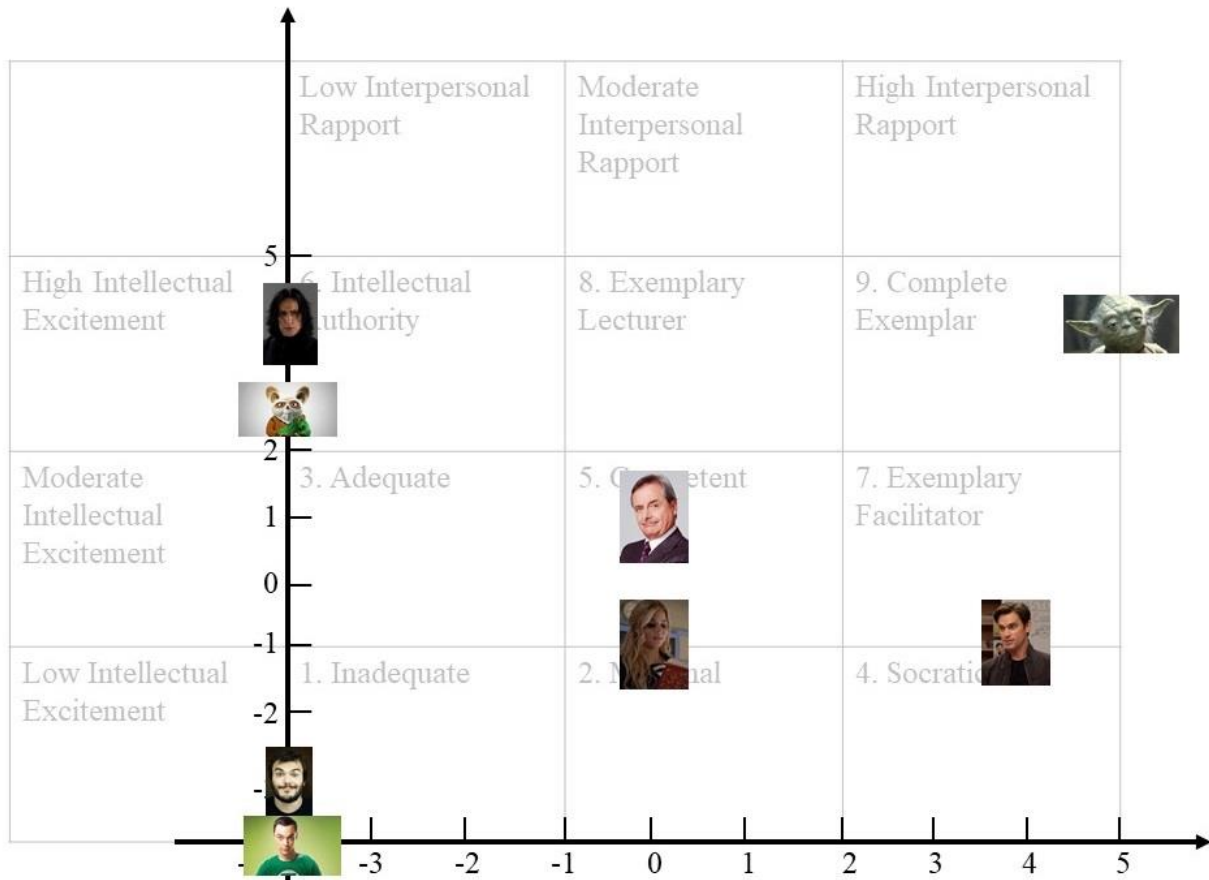
Figure 3. Assessment results for the instructors considered in this study.

While the rubric captures a ranking score, the intention is not to use the rubric as a measurement, but as a guide for direction. Yoda is a renowned character that most individuals would classify as a complete exemplar. However, in the clip presented in the case study, one can be reminded that his unique grammatical type of speech can make understanding difficult for a student. Further, his teaching style tends towards a Socratic approach that is more amenable to small classes, seminars, and advanced classes where students are more independently confident. Yoda may have an opportunity to improve his teaching skills if it were necessary to adapt to a larger lecture classroom where his banter and charisma might need to be replaced with a different style of delivery. Ultimately, the rubric is valuable in identifying the *direction of improvement* that one can take to find a more effective teaching style. Intellectual Excitement and Interpersonal Rapport are large categories and the rubric provides more specific guidance on more focused areas for improvement. The references described in the Character Development – Making a User-Friendly Rubric section provide specific advice on how to improve in these narrower categories.

Once comfortable with the rubric and the underlying development based on Lowman's categories, individuals can use the rubric both in personal assessment of classroom performance as well as in peer assessment. Ideally, individuals who seek to improve their teaching effectiveness can use this tool as a mechanism to find tangible actions that can positively

influence interpersonal rapport and intellectual excitement experienced by students. Both the quantitative composite score mapped to the graphic Lowman model work together to show current placement and provide guidance on the direction of change that can have the greatest impact on teaching performance. Further, focusing on providing feedback on five key categories in both Intellectual Excitement and Intellectual Rapport is manageable and provides sufficient detail for a user to gain specific insight into which descriptive categories to focus on.

Lowman's Teaching Model[1] recommends that instructors use the ideas of Interpersonal Rapport and Intellectual Excitement as guides towards becoming an effective professor. These categories are broad and it is apparent that the assessment of performance is unavoidably subjective. Each individual brings a unique perspective to a classroom experience, which influences their perception of the communication skills, organization, and caring spirit of the professor. While the proposed rubric does not eliminate the subjectivity of a professor's teaching performance, it does provide a tool for young professors to reflect on performance and identify focus areas that are shown to improve teaching.

Final Credits – Acknowledgements

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Table A1. Example: Yoda's Intellectual Excitement assessment.

	Engaging (enthusiastic, inspiring, humorous, interesting, exciting, energetic, fun, stimulating)	**Knowledgeable** (inspiring, interesting, clear, engaging, stimulating, lectures well)	**Organized** (clear, prepared, lectures well)	**Good Communicator** (interesting, clear, engaging, creative)	**Committed to Teaching** (enthusiastic, knowledgeable, engaging, creative)
Positive +1	*Fun *"Truly amazing, the mind of a child" *Stimulates student thinking	*Obviously knowledgeable about use of the Force		*Engages students at their level *Debate about "Yoda speak" and its potentially distracting impact	*Accepting student feedback that means big trouble for the Jedi *Working on next steps right away
Neutral +0			+Clear lesson plan -Allows a huge distraction with Obi Won busting in		
Negative -1					
SCORE FOR EACH CATEGORY	**1**	**1**	**0**	**1**	**1**
TOTAL INTELLECTUAL EXCITEMENT SCORE	**4**				

Table A2. Example: Yoda's Interpersonal Rapport assessment.

	Caring (concerned, interested, respectful, encouraging, motivating)	**Available** (accessible, helpful, patient)	**Personable** (concerned, caring, friendly, approachable, interested)	**Understanding** (accessible, respectful, fair, motivating)	**Challenging** (demanding, motivating)
Positive +1	*Cares for students *Involves them *"Truly amazing, the mind of a child"	*Obi Won walks into class to get help	*Has fun *Enjoys teaching *Laughs and jokes with students	*Accepts answer that means trouble coming	*Obi Won can't solve the problem, so he gives it to kids
Neutral +0					
Negative -1					
SCORE FOR EACH CATEGORY	**1**	**1**	**1**	**1**	**1**
TOTAL INTERPERSONAL RAPPORT SCORE	**5**				