Achieving Educational Excellence: What do Effective Instructors do?

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ABSTRACT

With the publication of the Army Learning Model (ALM; U.S. Army Training and Doctrine Command, 2011), the Army seeks to shift the nature of instruction from instructor-centric to learner-centric and integrate technology into training and education to a greater extent than has been done in the past. Specifically, the ALM directs course proponents to:

- Use more problem-solving approaches in the classroom, with instructors adopting a facilitator role rather than a lecturer role.
- Customize content and methods to learners' needs.
- Increase the use of interactive technology in learning.

Recent research efforts to develop a framework to select, develop, and evaluate Army instructors revealed a lack of requirements for instructors of adult learners in an environment of interactive, engaging, and learner-centric education. Through a review of military and education literature and a workshop with subject matter experts, a definition of an effective instructor was developed initially. Subsequently, 13 work behaviors and 32 knowledge elements, skills, abilities, and other characteristics (KSAOs) were identified as being necessary for an instructor to be effective in a learner-centric environment. These behaviors and KSAOs were then used to generate tasks performed by instructors in a learner-centric classroom. Data were gathered from instructors regarding the importance of these tasks, the frequency with which they are performed, and the effectiveness of instructor training in teaching these tasks. The behaviors, KSAOs, and tasks can be used in the selection, development, and evaluation of instructors who can effectively implement learner-centric practices and technology into their instruction.

The framework developed through the research and analysis will be described along with the next steps to identify training for Army instructors. Follow on work with the behaviors, KSAOs, and tasks is focused on identifying training for Army instructors to prepare them to implement the directives of ALM. This training is intended to complement the training Army instructors currently receive.

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INTRODUCTION

The U.S. Army is facing – and will face for the foreseeable future – several challenges and opportunities in terms of the way it trains and educates Soldiers. Among these challenges and opportunities are:

- High operational tempo that requires maximizing the efficiency of time spent training and educating Soldiers.
- Varied and rapidly changing operational environments, requiring lessons learned in the field to be incorporated quickly into training and education.
- Technology savvy Soldiers entering the Army, many of whom are very comfortable with or even dependent on technology for learning and staying connected to others.
- Soldiers with great depths of real world experience gained from repeated deployments to the wars in Iraq and Afghanistan.
- Evolving requirements for instruction and expansion of the construct of "instructors."

These challenges imply that the time spent training and educating Soldiers must be used efficiently; opportunities to train and educate must be maximized (i.e., not all training can take place in a classroom); content and materials used in training and education must be adaptable and incorporate lessons learned in as near to real-time as possible; and training and education must not only be engaging for experienced Soldiers, but must also make use of their wealth of experience.

As part of the response to these challenges, the Army is exploring how to effectively shift from instructor-centric to learner-centric training and education and to integrate technology into training and education. These are central themes of the United States Army Learning Model (U.S. Army Training and Doctrine Command, 2011). The Learning Model directs course proponents to 1) use more problem-solving approaches in classrooms, where the instructor takes on more of a facilitator role, rather than a lecturing role; 2) make training and education more learner-centric by customizing content and methods/modalities to the learner's needs; and 3) increase the use of interactive technology in learning.

These changes mean that the instructor role in Army education is shifting from what it has traditionally been to one that supports more student-centric, problem-based learning. To support these changes, we undertook a project addressing the following objectives:

- Characterize a program of education for Army instructors that prepares instructors for both formal and informal Army teaching environments.
- Identify individual characteristics useful for selection of Army instructors.
- Identify usable methods and tools for assessing Army instructors' effectiveness.

Personnel functions do not occur in isolation from one another in terms of the job and person requirements that inform them. To successfully align personnel functions of selection, preparation/training, and performance assessment—as well as other personnel functions such as recruitment and promotion—it is important that each of these functions be informed and guided by a common set of job requirements (i.e., roles/practices, task categories, tasks) and person requirements (i.e., knowledge, skills, abilities, other characteristics (KSAOs). Personnel psychology has long documented the importance of conducting a job analysis prior to the development and implementation of personnel

functions such as selection, training, performance appraisal/assessment, and promotion, as these personnel functions are dependent upon the job and person requirements derived from the job analysis (Gael, 1988; Landy, 1989; McCormick, 1979). For example the well-known Army Alpha and Army Beta assessment projects in World War I are often cited as the first attempt to delineate the nature of officer work and person requirements in order to inform the development of officer selection and assignment of officers (Bingham, 1919).

Seven primary research questions were used to help guide this effort. These included:

- What does it mean to be an effective instructor?
- What knowledge, skills, abilities, and other characteristics do instructors need in order to be effective in the classroom?
- What work behaviors do instructors need to perform to be effective in the classroom?
- What are the goals or outcomes of effective instruction?

We addressed these questions through a review of the literature, a workshop with subject matter experts (SMEs), and phone interviews with additional SMEs. We then conducted a content validation study through the collection of importance and frequency ratings of KSAOs. To calibrate the team and our efforts and establish a baseline, we focused initially on the first question and developed a definition of an effective instructor.

METHOD

Literature Review

We began by identifying relevant literature and documents (civilian and military) that specified and described the job requirements (roles/practices, task categories, behaviors, tasks) and the person requirements (KSAOs, KSAO clusters) of instructors in student-centered learning environments. For example, research attempted to describe both job requirements (the authors classified them as functions and competencies) and person requirements (the authors referred to these as characteristics) (Cianciolo & Bickley, 2011; Cianciolo, Grover, Bickley, & Manning, 2011). We also conducted a systematic review of literature addressing the selection, development, and evaluation of instructors, both military and civilian.

Based on the literature review, we drafted an initial list of job and person requirements. In addition, we identified methods for selecting, developing, and evaluating instructors and the evidence to support each method.

SME Workshop

To help further refine the draft set of job and person requirements identified during the literature review, a three hour workshop was held with 10 military and civilian SMEs in the fields of education and training. This included experts in the areas of Army training and education (4), Army institutional training (2), civilian training and education (2), job analysis (1) and instructional design (1). The workshop was convened in November 2013 and was conducted in four segments. First a broad topic discussion was conducted on what it means to be an effective instructor. Then participants were shown the list of job requirements identified during the literature review and asked a series of open-ended questions regarding the list's accuracy and what might change with differences in the type of training. Next, a similar set of open-ended questions was asked of participants regarding the list of person requirements developed during the literature review. Lastly, a brainstorming session was conducted to identify additional references as well as experts within the field of education and training that could help with later phases of the project.

Interviews

The brainstorming session identified nine SMEs in the fields of education and training. These included seven university/college professors and two elementary education teachers/professionals, all of whom participated later in individual phone interviews addressing methods and criteria for selecting, developing, and evaluating instructors. Areas of SME expertise included teacher instruction, curriculum development, education, cognitive psychology, and school leadership

RESULTS

The results of the abbreviated job analysis are organized below into three main sections. The first section displays the job requirements (i.e., work behaviors) instructors need to exhibit in order to be effective. The second section provides the person requirements (i.e., KSAOs) instructors need to have in order to be effective. The final section provides the operational definition for an effective instructor that was developed from the results of the job analysis.

Work Behaviors

A total of 13 job requirements (i.e., work behaviors) were identified as essential for instructors to exhibit in order to be effective (see Figure 1).

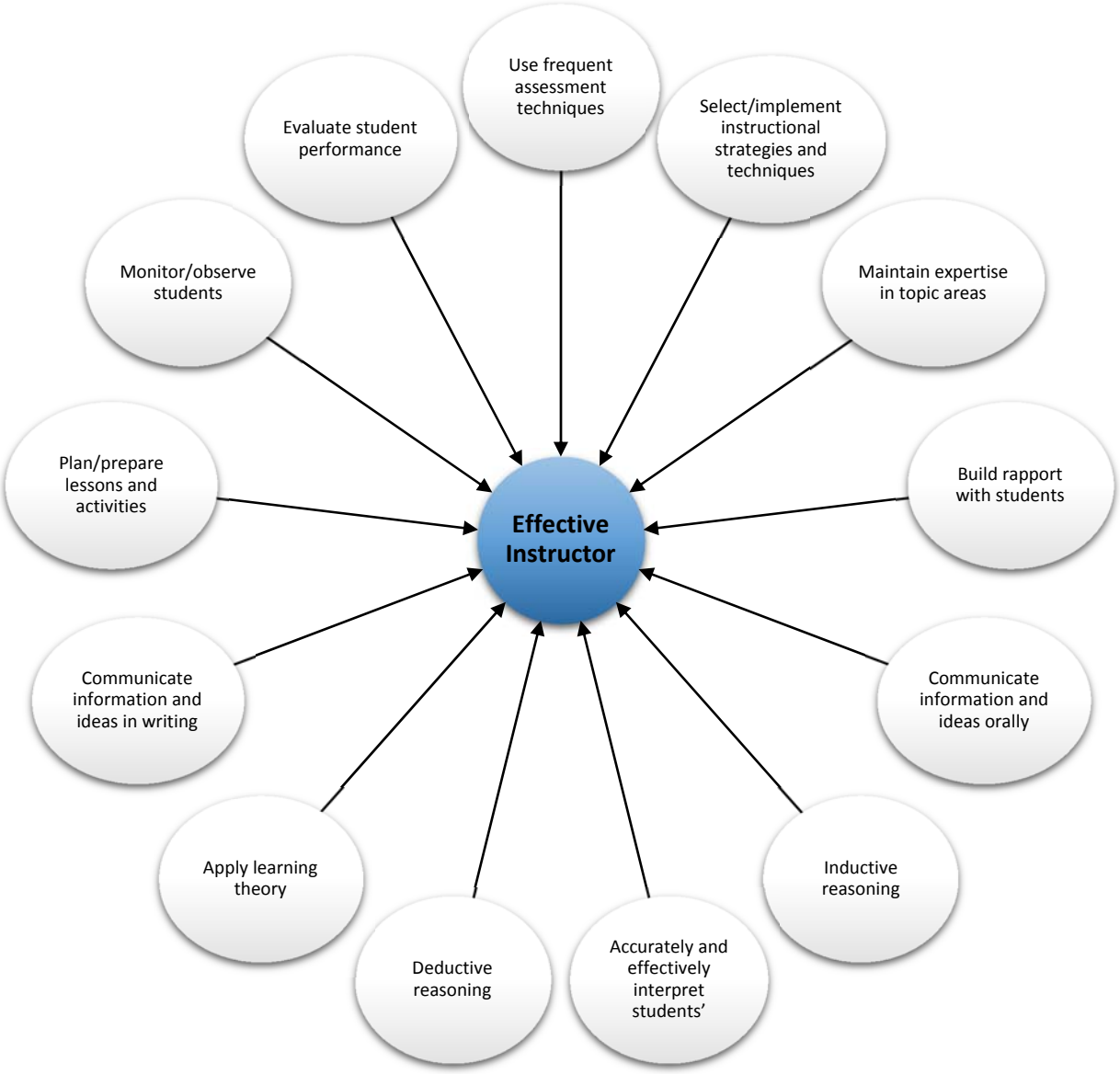

Figure 1. Work Behaviors for an Instructor to be Effective

KSAOs

A total of 32 KSAOs were identified as essential for instructors to be effective (see Figures 2, 3, 4 and 5). Knowledge elements spanned specific course content (K1), general teaching and evaluation strategies and methods (K4, K5, K6,

K8), learner characteristics (K2, K3), and communication (K7). Similarly, the skills also focused on application of knowledge in student observation and assessment (S1, S2, S4), teaching and coaching strategies (S3, S5, S7, S8), providing feedback (S6) and using technology (S9). Abilities focused on communication and information organization (A1, A2, A5), interpreting student inputs (A3), and applying learning to specific circumstances and problems (A4, A6). Lastly, other characteristics spanned a variety of traits, perspectives and values that would contribute to being open to student needs and professional development and behaviors.

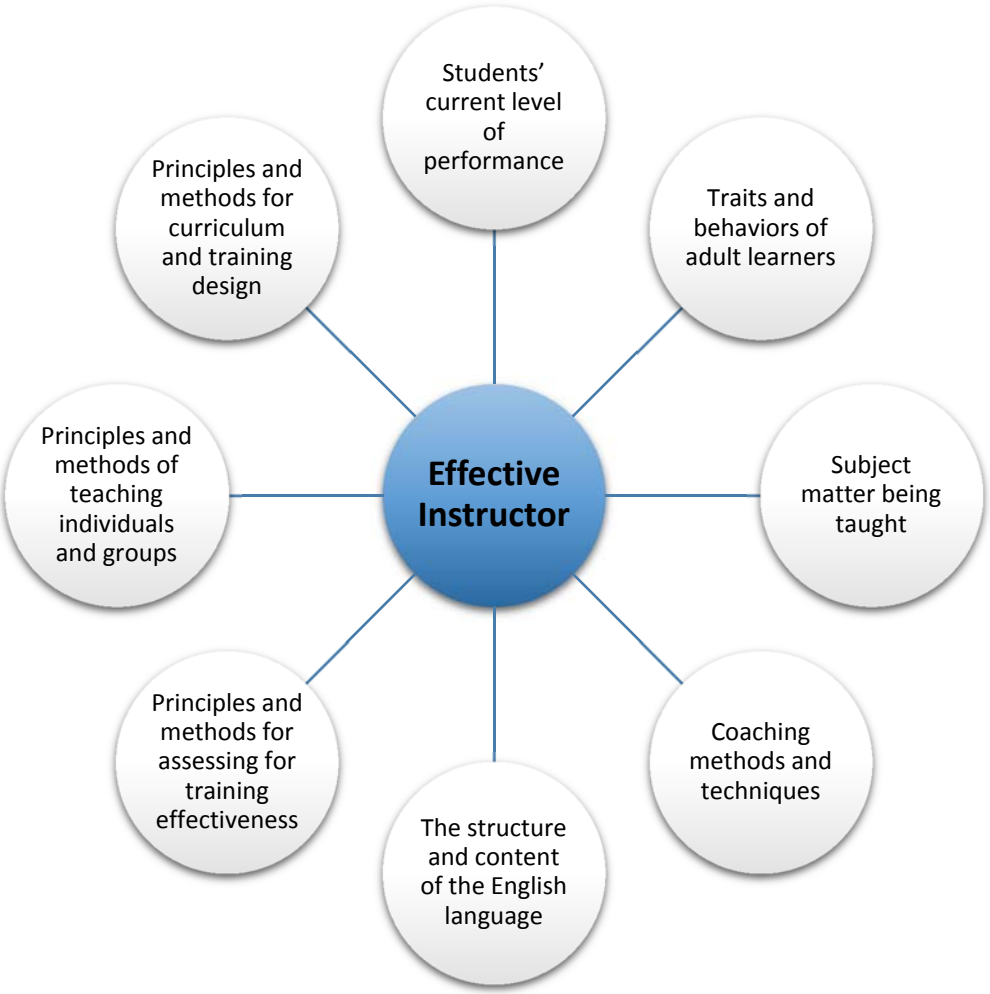

Figure 2. Knowledge Required for an Instructor to be Effective

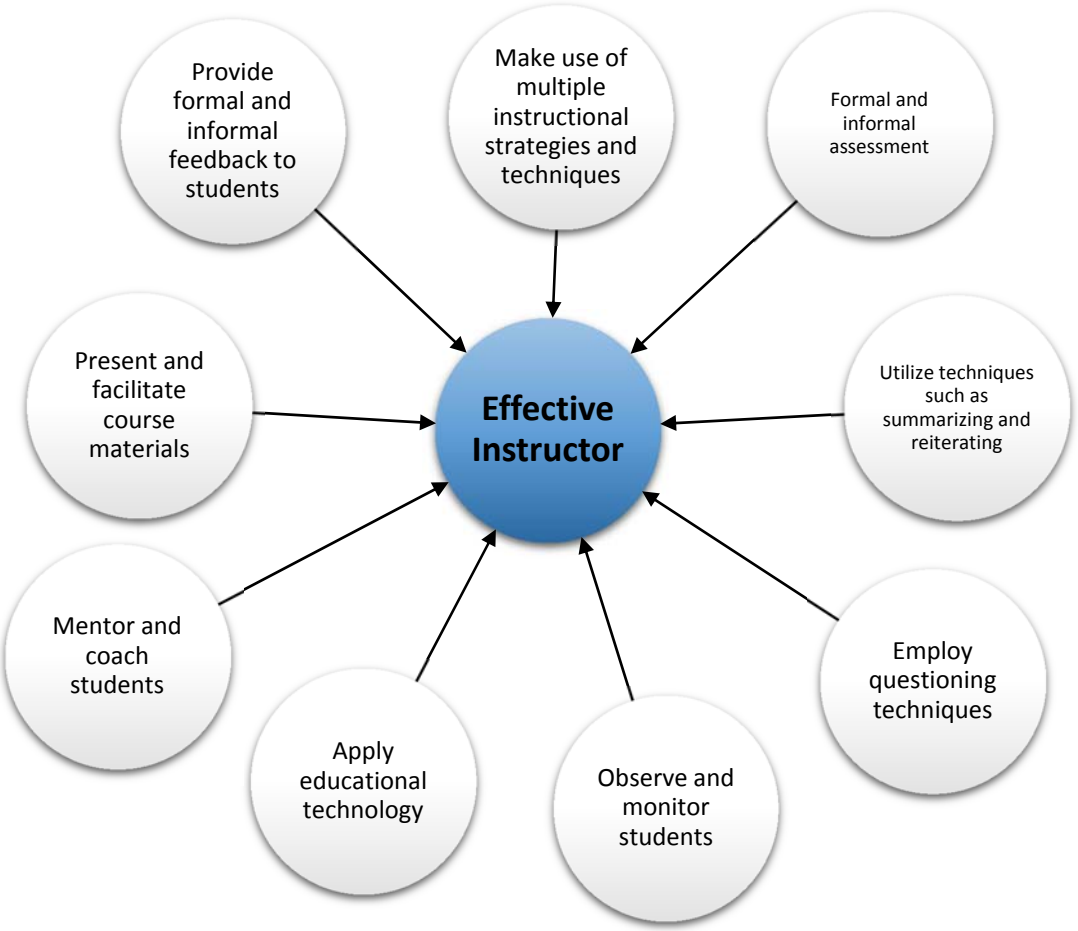

Figure 3. Skills Required for an Instructor to be Effective

Figure 4. Abilities Required for an Instructor to be Effective

Figure 5. Other Characteristics Required of an Instructor to be Effective

Operational Definition of an Effective Instructor

Based on the literature review, workshop, and additional input from SMEs, we developed the following operational definition for an effective instructor:

"An effective instructor is one who can, by perceiving the individual differences in students and learning environments and applying instructional strategies and techniques as appropriate for the situation, create positive student outcomes related to the short and long term objectives of a course."

Some examples of what is meant by "applying instructional strategies and techniques" and "creat[ing] positive student outcomes" can be found in Table 6. Please note that these lists are not comprehensive.

Table 1. Examples of Instructional Strategies and Techniques and Positive Student Outcomes

Instructional strategies and techniques	Positive student outcomes
Observing and monitoring	Knowledge retention
Questioning techniques	Knowledge transfer
Active listening	Student scores from rigorously validated tests
Formal and informal assessment	Student motivation
Formal and informal feedback	Student self-efficacy
Mentoring and coaching	Skill development
Presenting and facilitation	

Framework for Selecting, Developing, and Evaluating Instructors

For each KSAO and work behavior, we conducted a judgment exercise to determine whether the Army could reasonably expect to train that KSAO or work behavior during instructor development, or whether the Army should attempt to identify candidates with that KSAO or work behavior during instructor selection.

For some KSAOs, both the Select and Develop processes were selected as it could not be reliably determined that only one process was clearly optimal. For example, for the KSAO "Skill at mentoring and coaching to develop student leadership skills and motivation," it was determined that instructors would likely already have exhibited coaching, and to a lesser extent, mentoring behaviors as a result of being in previous unit training or leadership positions. However, it was also felt that additional training and development in coaching and mentoring would be very valuable to ensure best practices in these behaviors are exhibited in Army institutional training assignments. It was difficult for the team to unequivocally determine the optimal process applicable for each KSAO due to this type of interaction between previous and future behavioral expectations of instructors.

Both identification and preparation methods proposed are dependent on several factors, including resources available to develop selection instruments and development content, the time available for either selecting or developing instructors, and the effectiveness of the selection or developmental method. The methods proposed for the identification process consisted of:

- Qualifications – as established through various instruments including OER/NCOERs, resumes, portfolios, and other documentation.
- Interviews – principally structured interviews.
- Demonstrations and work samples – structured simulations that would require the candidate to demonstrate the KSAOs under assessment. These would include writing samples and sample lectures.
- Tests – such as personality and other written tests.

The methods proposed for the preparation process included:

- Reading – generally self-study of written materials on the KSAO topics or subjects.
- Lecture – generally learning from others with in-depth knowledge and experience in the topic or subject (KSAO).
- Discussion – either with a knowledgeable other or within a learning context such as a discussion group or small group.
- Problem Solving – general term for methods that include a wide range of exercises to engage future instructors in thinking about real world applications of the KSAO and in particular, working through various challenges or problems with instructing.
- Role Play – methods that encourage future instructors to demonstrate behaviors during simulated interactions with others, often with scripts or structure to ensure certain behaviors are exhibited.
- Simulation – other simulations which may include computer based exercises, virtual environments, and games which encourage future instructors to try out behaviors with the KSAO domain.
- Reports and other demonstrations – assignments given during instructor preparation that would demonstrate proficiency in the KSAO under assessment.

The methods proposed for instructor evaluation are also dependent on several factors, including the intended purpose of the measurement (i.e., formative or summative), the resources available to develop sound measures (e.g., instruments, protocols, rubrics), and the resources available to conduct evaluations (e.g., personnel time and availability). The methods proposed for instructor evaluation processes included:

- Classroom observations – conducted by supervisors, instructor peers, or third party observers with relevant instructional and content knowledge and in a position to provide valid judgments of student/instructor performance.
- Student achievement – student achievement scores or measures of student growth/gains as assessed by pre- and post- measures.
- Student evaluation of teaching – ratings and written evaluations by students of the instructor, representing the reaction level in training evaluation.
- Self-assessment – an instructor's own assessment of teaching practice, strengths and areas to improve, in the context of teaching requirements for that position.

Task Ratings

We created a measure based on the KSAOs in which the KSAOs were rewritten as 36 behavioral statements and labeled "tasks". The measure asked participants to rate the tasks in terms of importance and frequency. The measure has been administered to nine instructors so far and data collection is on-going.

All 36 instructor tasks were rated as moderately important or higher (i.e., very important, extremely important) by instructors, with the vast majority of tasks rated as either very or extremely important. Thirty-one of the tasks were rated as performed occasionally (or more frequently during instructional cycle). The mean ratings of the remaining six tasks suggest they are performed rarely to occasionally. Mean ratings of importance and frequency for each of the tasks are presented in Table 7.

Table 2. Importance and Frequency Ratings of Tasks

		Importance **How important is this task for successfully performing the job of 91A/91M instructor?** **1 = Not important.** **2 = Slightly important.** **3 = Moderately important.** **4 = Very important.** **5 = Extremely important.**	**Frequency** **How often do 91A/91M instructors perform this task?** **1 = Never.** **2 = Rarely in an instructional cycle.** **3 = Occasionally in an instructional cycle.** **4 = Frequently in an instructional cycle.** **5 = Very frequently in an instructional cycle (i.e., everyday).**	**Importance mean**	**Frequency mean**
Facilitating, Instructing, and Presenting	1	Communicate information and ideas orally by providing examples, stories or anecdotes that the learner can relate to as a means of facilitating learning/understanding.		4.0	3.3
	2	Communicate information and ideas by providing visual aids (e.g., models, diagrams) to articulate training content (e.g., conceptual or text-based).		4.0	3.3
	3	Present and facilitate course materials so that content and learning objectives are sequenced appropriately.		4.4	3.1
	4	Explain why lesson objectives are relevant, explicitly linking previously learned content with current content, and ensuring students grasp concepts before proceeding.		4.2	4.0
	5	Engage students and facilitate discussion by employing questioning techniques (e.g., probing, open-ended questioning).		4.4	3.8
	6	Explain why and when a particular task is performed so that learners understand the cognitive components of the skill required to perform that task.		4.1	3.3
	7	Demonstrate content domain expertise (i.e., technical expertise) while facilitating/guiding student learning in the learning environment (e.g., classroom, field training exercises, and maintenance bays, online).		3.9	3.7
	8	Demonstrate/model task performance in its entirety, breaking it down into steps and verbalizing each step, to provide learners with a mental picture of what the task looks like when performed correctly.		4.1	3.7
Assessing and Evaluating	9	Evaluate student performance through the use of quizzes/tests or writing assignments to determine if they are progressing and meeting the general outcomes and specific objectives of the course.		4.7	3.4
	10	Evaluate student performance through the use of interactive exercises (e.g., role playing, group discussion) to determine if they are progressing and meeting the general outcomes and specific objectives of the course.		4.1	3.4
	11	Diagnose learning needs (i.e., where students may be falling short of a learning objective/standard) via questions, queries, and probes of individual students and/or the class.		4.3	3.6
	12	Evaluate a student's performance by observation of their process of completing a task (e.g., assembling a piece of equipment), troubleshooting basic and complex issues, as well as a final outcome (e.g., the equipment functions properly).		4.7	4.3
	13	Interpret and address student frustration, lack of understanding, confusion, or lack of physical aptitude during a psychomotor (e.g., hands-on) skill execution.		4.6	3.6
	14	Ensure that learners can identify and define instruments/tools involved in a task/procedure and how to maintain the instrument/equipment/tool involved in the task.		4.2	3.3
	15	Use questioning techniques to assess cognitive objectives (i.e. student understanding) while a student is performing a motor task. For example, asking a student why they performed a particular step of a motor task or how it fits into a larger process.		4.4	3.8

Preparing Instruction and Managing the Classroom	16	Prepare supplemental instructor notes for potential questions, key points, and list of examples.	3.9	2.8
	17	Prepare physical training environment by ensuring all equipment is available and functioning, classroom is set up properly, and all materials are available for students.	4.4	4.1
	18	Facilitate unstructured classroom time to foster ongoing learning and practice.	3.8	2.8
	19	Build rapport with students to develop credibility with students and to ensure they are engaged in learning, feel comfortable asking questions, and have a positive affect towards both the instructor and the material being taught.	4.6	4.1
	20	Identify and address difficult or disruptive classroom behavior and student disciplinary issues.	4.7	3.8
	21	Coordinate logistics for practicing skills in different environments as skill level progresses (crawl, walk, run). As an example, transitioning students from desktop practice to full simulators to performance on live equipment and responding to situations when access to the practice environment is restricted.	4.0	3.3
	22	Respond to the inability to observe all students practicing/performing on pieces of equipment by employing other instructors or students who have mastered skills to observe and provide feedback to students.	4.1	3.3
	23	Modify working conditions (e.g., time constraints, physical environment) and/or the amount of information available to create varied opportunities for students to practice skills and apply them in new contexts. This may include the use of hands-on models, simulations, and actual equipment.	4.0	3.7
Tailoring Instruction to Learner Needs	24	Communicate information and ideas orally through the use of rephrasing or by tailoring content based upon the skill/experience level of the learner to facilitate learning/understanding.	4.7	4.2
	25	Tailor the presentation of text and visual aids/diagrams based upon the skill/experience level of the learner to facilitate learning/understanding.	4.1	2.9
	26	Provide students with additional support in the form of mentoring and coaching (e.g., out of classroom time/instruction and supplemental exercises/activities).	3.9	2.8
	27	Interpret and attend to the verbal and non-verbal cues from students that may signal a lack of understanding, motivation, or attention/engagement and adjust the communication style accordingly.	4.3	3.4
	28	Provide specific and timely feedback that is performance-based and non-judgmental, focusing on both what was performed correctly and areas for improvement.	4.7	3.4
	29	Leverage different instructional options available in the Plan of Instruction to account for differences in subject domain/content, the learning environment, and individual differences in student behavior/thought processes.	4.2	3.2
	30	Facilitate student progression of a psychomotor procedure following an unsuccessful attempt while ensuring that the student can actually complete the procedure without instructor assistance.	4.6	3.8
Leverage Instructional Technology	31	Apply required educational technology during class such as mobile learning devices, interactive whiteboards, and student response systems in ways that will support and enhance student learning.	3.3	3.3
	32	Retrieve and analyze any data that may be generated from simulated equipment to assess a student's performance.	3.0	2.2
	33	Provide students with targeted feedback on their performance using simulated or live equipment (i.e., what went right and what went wrong) and explain the impact/consequences associated with performance.	4.7	3.8
	34	Engage students by promoting healthy competition and peer to peer collaboration while using equipment simulators or game-based training.	3.7	3.1
	35	Troubleshoot technical issues (or know who to contact for help) that arise while students are using live or simulated equipment.	4.2	3.7
	36	Instruct students on the use of simulators with minimized fidelity/equipment functionality (e.g., a tank simulator that uses keyboard controls as opposed to an actual steering device).	3.0	2.3

DISCUSSION

The proposed framework was developed to further inform existing Army instructor selection, training and evaluation processes by providing the dimensions (e.g., KSAOs and work behaviors) as well as specific methods for optimal identification, development and evaluation of instructors across an array of institutional programs. Individual Army training programs can use the framework to determine the extent with which current selection, training and evaluation processes are aligned with best practices and potentially develop additional methods and techniques for greater coverage of requisite KSAO measurement. The framework also supports ongoing efforts to improve learner-centric instructor skills and provides a basis for evaluating instructors on specific KSAOs and work behaviors that are supportive of learner-centric skills.

As mentioned previously, we are continuing to collect data on the 36 tasks. These data provide the basis of a needs analysis to identify the tasks that need additional training than what is currently happening. The next phase of the work is to develop a training module to address the gap between what is currently trained and what is needed. Pilot data will be collected. The intention is to develop a prototype process for conducting the needs analysis and identifying needed training, such that it could be used by schools across the Army.

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