

Pre-Clerkship Medical Students' Perceptions of Learning Objectives: Definitions, Uses, and Communication

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Abstract

Learning objectives are intended to be used as tools for both instructors and students. Student use of learning objectives is related to developing metacognitive skills and self-regulation of learning. Many medical institutions provide learning objectives to their pre-clerkship students, but it is unknown if or how the students use them. A questionnaire was designed to investigate current pre-clerkship medical students' perceptions of learning objectives to include definitions, degree and methods of use, and communication from instructors regarding learning objectives. Free-response data from complete and partial records (n = 279) underwent inductive thematic analysis. Quantitative data showed 98.5% of students are aware of learning objectives for their basic science courses but 59% of students do not use them. One hundred and thirty-six students indicated a perception that their instructors do not communicate about learning objectives (n = 273). Qualitative data was organized into three themes to further describe 1) the perception of communication regarding learning objectives from their instructors, 2) how these students define learning objectives, and 3) how these students use learning objectives. Interestingly, this study revealed that perceptions of learning objectives varied greatly among students within the same cohort despite the fact the conditions of their learning environments were consistent. Further research into why perceptions differ among students of the same cohort is merited. <https://doi.org/10.21692/haps.2024.014>

Key words: learning objectives, medical education, pre-clerkship education, thematic analysis

Introduction

A learning objective refers to a measurable goal or standard of performance to be achieved by a student upon completion of a lesson or activity (Webb et al., 2013). Learning objectives are a useful tool for instructors and are often a crucial component of curricular design. Proper implementation of learning objectives can aid instructors in practicing backwards curriculum design, maintaining curricular alignment, and staying within the scope of knowledge appropriate for students (Biggs & Tang, 2007; Lachlan-Hache et al., 2012; McMahon & Thakore, 2006; Wang et al., 2013). Improper use of learning objectives can lead to detrimental results such as decreased instructor and student satisfaction, performance, and confidence, and increased frequency of miscommunication and feelings of frustration

(Alsheikh, 2014; Floyd et al., 2009; Leone et al., 2019; Orr et al., 2022).

Learning objectives are also intended as tools for students, but little literature exists to describe student use of learning objectives, especially within the pre-clerkship medical student population. The use of learning objectives in medical education is designed to aid students by helping them form expectations regarding specific aspects of the curriculum (Chatterjee & Corral, 2017). These include content topics, depth of understanding, and methods by and conditions under which the student will be assessed (Chatterjee & Corral, 2017; Orr et al., 2022). Benefits for students using learning objectives may include development of metacognitive habits such as self-assessing and monitoring

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progress, even accurately predicting their own performance (Kuhn & Rundle-Thiele, 2009; Maher, 2005). Students may adopt deep learning approaches to enhance conceptual understanding, which are associated with higher levels of academic performance and long-term retention, rather than relying on surface learning and rote memorization. (Biggs & Tang, 2007; Boud, 1995; Floyd et al., 2009; Paliokas, 2009). Additional studies have shown that student use of learning objectives can also increase students' intrinsic motivation and performance (Campbell & Campbell, 1988; Stipek, 1996). While these studies identified some benefits to students using learning objectives, they did not account for other positive effects that may have resulted from having better curricular alignment or instructors using more active learning strategies. Acknowledging this fact, it becomes difficult to understand why the Liaison Committee on Medical Education (LCME) requires program-level learning objectives be made available to medical students as part of their accreditation standards (AAMC, 2024; Kassebaum, 1992).

Requiring learning objectives to be made available to pre-clerkship medical students is based on two assumptions, neither of which has been confirmed in the literature. The first assumption is that medical students will use learning objectives if they are made available. One study found over one-fourth of undergraduate college students do not use learning objectives with the most common reason being they found other resources to be more helpful for their learning (Osueke et al., 2018). It is not unreasonable to speculate that similar trends exist in pre-clerkship medical students, considering that many are transitioning from the undergraduate college population.

The second assumption is that medical students know how to use learning objectives prior to entering medical school. Research has shown many undergraduate college students never receive explicit instruction on how to use learning objectives; therefore it is reasonable to postulate that pre-clerkship medical students also do not possess this skill (Osueke et al., 2018). Additional research has shown that not only do students generally welcome this specific instruction, but that there are positive effects to providing it, such as the development of metacognitive habits (Bjork & Bjork, 2011; Osueke et al., 2018). This suggests the importance of communication regarding how to use learning objectives from instructor to student in the pre-clerkship years of medical education. Previous work suggests this communication may not consistently occur and that perceptions regarding this communication and the actual use of learning objectives differ between medical educators and pre-clerkship medical students (Pavlick et al., 2024).

This study was designed to explore if and how pre-clerkship medical students use learning objectives and their perception of how their basic science instructors communicate about learning objectives.

Materials and Methods

Study Design

This study utilized a mixed-methods phenomenological approach to explore existing pre-clerkship medical student perceptions and experiences with using learning objectives. The study adopted a constructivist framework while developing the free-response portion of the questionnaire to allow respondents the opportunity to express their unique experiences without bias from provided answer choices. This study was approved by the University of Mississippi Medical Center Institutional Review Board (#UMMC-IRB-2022-187).

Setting and Participants

All first- and second-year medical students enrolled in an allopathic medical institution in the southeastern United States were invited to participate in this study.

Questionnaire Design

The researchers created a questionnaire to explore several aspects of learning objectives as perceived by current pre-clerkship medical students. This included inquiry on experiences, degree and method of use, and perception of communication from pre-clerkship basic science medical educators regarding learning objectives. The questionnaire was constructed by the lead author (KP) and included nine categorical questions and six free response questions. The questionnaire was reviewed with the co-authors (AN and CB) on several occasions before a final version was created. Progression through the questionnaire was dependent on branching logic from several questions. For example, if a student responded "No" or "Not Sure" to Question 6 ("Do you know if there are learning objectives available for your basic science courses?") then they were instructed to omit Question 7 ("Do you use the learning objectives in your basic science courses?") and proceed directly to Question 8 ("Prior to entering medical school, were learning objectives available for your typical courses?"). Please refer to Appendix 1 for the full version of the questionnaire.

Data Collection

The questionnaire was distributed in person and on paper during the fall semester of 2022. Distribution occurred in the last ten minutes of a mandatory didactic lecture in a medical histology and cell biology course for first-year students and a medical microbiology and immunology course for second-year students. Both course directors provided written permission for data collection and their choice of which session for researchers to collect data. An informed consent statement was read to students prior to the questionnaire distribution which described the study's purpose and nature. Students were informed that neither course director would have access to any collected data to mitigate potential student concerns and encourage participation. All attending students were provided with a blank questionnaire and ten

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minutes to complete it if they chose. All students were asked to turn in their questionnaire to a collection box regardless of completion and/or participation to maximize anonymity.

All researchers had served in a teaching role in previous courses for both cohorts and were aware of potential biases this might cause. The lead and one additional researcher (KP and CB, respectively) served as graduate teaching assistants while the other additional researcher (AN) served as a course director and instructor. This was considered and addressed by waiting until their teaching roles ended and students were enrolled in different courses with which none of the researchers were involved before collecting data.

Data Management

All questionnaire data was transcribed into a Microsoft Excel file and original questionnaires were stored in three-ring binders within a locked filing cabinet. Only the lead researcher (KP) had direct access to the digital file through an institution affiliated password protected account. Additional researchers (AN and CB) were provided access to the deidentified digital data through shared permissions

from the lead researcher. Each record was given a cohort identification (M1 or M2) and Record ID number which indicated the order of sequence the lead researcher transcribed the data.

Data Analysis

All questionnaire data was retained for analysis except when the respondent selected more than one response to a single selection question (e.g., selecting "Yes" and "No"). Quantitative data was analyzed using SPSS, Version 28.0. Chi-square tests were used to determine significant difference in cohort response rates to categorical questions with a p -value set at 0.05.

Free response questions underwent inductive thematic analysis as described by Kiger and Varpio (2020). All researchers reviewed the data before independently assigning initial codes. Initial codes were then compared among all researchers to discuss differences and modifications. The reiterative nature of thematic analysis necessitated all researchers to meet and discuss codes multiple times until consensus was reached among final codes. Themes and sub-themes were generated

independently by each researcher based on the final codes. All researchers then compared themes and sub-themes to discuss differences and generate final themes and sub-themes upon which all agreed.

Results

Complete and partial questionnaires were retained for analysis ($n = 279$), resulting in an 84% response rate. The first three questionnaire items asked participants' age range, race, and highest level of education (Figure 1). The most frequently reported age range, race, and highest degree earned were 20 to 30 years old ($n = 131$), Caucasian ($n = 198$), and bachelor's degree ($n = 208$), respectively.

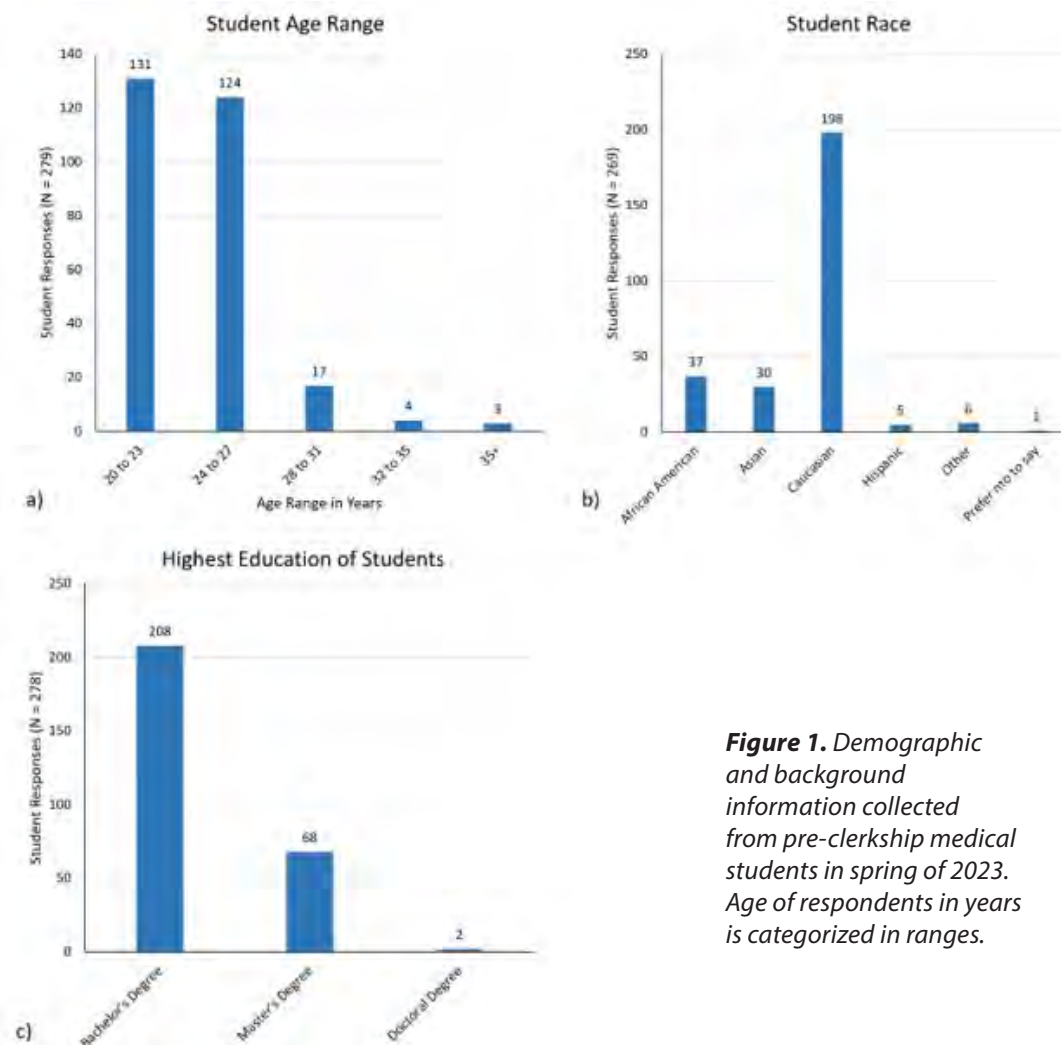


Figure 1. Demographic and background information collected from pre-clerkship medical students in spring of 2023. Age of respondents in years is categorized in ranges.

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Five items on the questionnaire collected categorical data (Table 1). Combined cohort response rates were analyzed using Chi-square tests for independence with a p -value set at 0.05. The majority (68.7%, $p < 0.001$) of students indicated they were aware of available learning objectives for previous undergraduate courses, with less than half (45.2%, $p < 0.001$) indicating they knew how to use them prior to entering medical school. Nearly all students (98.5%) indicated they were aware of available learning objectives for their current basic science courses but the majority (59.7%, $p = 0.0116$) indicated they do not use them. There was virtually no difference in responses regarding perceived communication from their instructors regarding learning objectives ($p = 0.9517$).

| Question | Responses | M1 | M2 | Total | |
|--|-----------|-----|-----|-------|--|
| Do you know if there are learning objectives available for your basic science courses? | Yes | 137 | 130 | 267 | $<0.0001^*$ $\chi^2 (2, N = 271) = 518.288, p < 0.0001$ |
| | Not Sure | 3 | 0 | 3 | |
| | No | 1 | 0 | 1 | |
| Do you use the learning objectives in your basic science courses? | Yes | 56 | 49 | 105 | 0.0116^* $\chi^2 (1, N = 261) = 9.965, p < 0.0016$ |
| | No | 80 | 76 | 156 | |
| Prior to entering medical school, were learning objectives available for your typical courses? | Yes | 101 | 90 | 191 | $<0.0001^*$ $\chi^2 (2, N = 278) = 166.496, p < 0.0001$ |
| | Not Sure | 26 | 39 | 65 | |
| | No | 14 | 8 | 22 | |
| Prior to entering medical school, did you know how to use learning objectives? | Yes | 69 | 59 | 128 | $<0.0001^*$ $\chi^2 (2, N = 283) = 19.216, p < 0.0001$ |
| | Somewhat | 27 | 48 | 85 | |
| | No | 44 | 26 | 70 | |
| Have your basic science instructors communicated how to use their learning objectives? | Yes | 80 | 57 | 137 | 0.9517 $\chi^2 (1, N = 273) = 0.004, p = 0.9517$ |
| | No | 59 | 77 | 136 | |

Table 1. Categorical questions and corresponding statistical measures from the pre-clerkship medical student data.

Qualitative Data

From the 279 records that were retained, 1,199 free responses underwent inductive thematic analysis which led to the researchers creating three independent themes: 1) Students define learning objectives as tools, 2) Students use learning objectives in various ways, and 3) Instructor communication about learning objectives is varied (Figure 2).

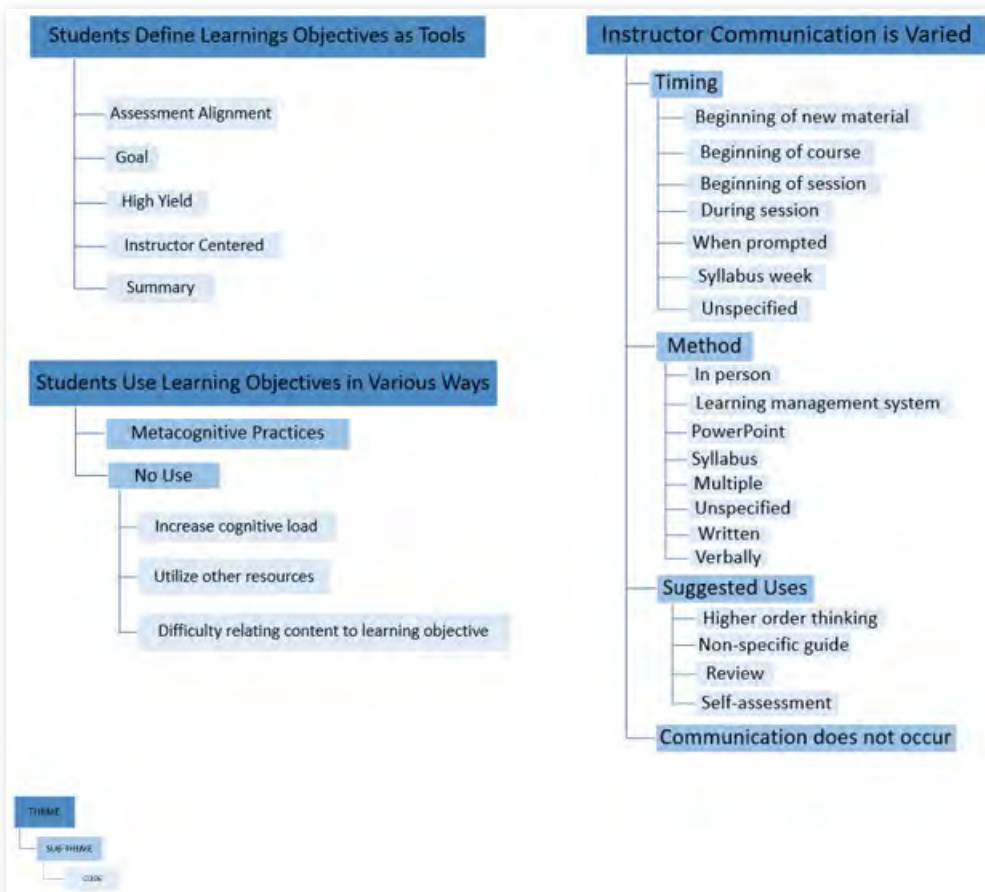


Figure 2. Thematic analysis of pre-clerkship medical student data visually represented in hierarchical format with themes located at the top of each tree. Sub-themes and their corresponding codes are located below each theme.

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Theme 1: Students define learning objectives as tools

The first theme was generated based on responses which described how the sampled students perceived learning objectives as a tool to be used during their pre-clerkship studies. This included perceptions of learning objectives as a communication tool to convey pre-determined goals, expectations for learning, or content to be included in the learning session. The following quotes represent these ideas:

"[A learning objective] is a pre-established goal given to students before studies begin. It is generally an important topic or concept for a course." (Record ID M1-21)

"A summary of expected learning before a given lecture and a check for making sure nothing is missed." (Record ID M2-13)

"What material will be covered within a lecture." (Record ID M2-28)

Also, students defined learning objectives as a preparation tool to aid in studying and preparing for assessments because they expected alignment between learning objective and assessment. That is, the learning objective describes what content the student should master to succeed on the assessment and evaluates understanding of the material described in the learning objectives.

"Topic list for exams – essentially mainly what we should know" (Record ID M1-102)

"Topics that will be tested on." (Record ID M2-24)

"A clear statement of expectation from professors as to what students are to gain from a particular topic, and what will be tested." (Record ID M1-39)

Similarly, learning objectives were defined as a guiding tool which helped students organize and prioritize high-yield information as described by Record ID M2-102 who stated learning objectives were a "summation of topics to be covered by a course/lecture. The most necessary information to learn." (Record ID M2-102).

Theme 2: Student's use of learning objectives

The second theme was generated to describe if respondents utilized learning objectives. This theme was further organized into two sub-themes to distinguish between responses indicating use versus those who indicated they did not use learning objectives.

Sub-theme 2A: Metacognitive practices. Responses indicating active use of learning objectives followed questionnaire branching logic which asked in what ways they used learning objectives. Reported uses largely described practicing elements of metacognition. One practice included students using learning objectives to prepare for a learning session by priming themselves with the material.

"Generally, I look at them to get a good idea of what is going to be covered in the material." (Record ID M2-99)

"Sometimes, I will skim the [learning objective] at the beginning of each [PowerPoint] to get a brief idea of what to expect while I read." (Record ID M2-117)

"I read them to get an idea of important upcoming concepts before learning them, and later use them for quick review." (Record ID M1-21)

Another metacognitive practice for which the students indicated that they used learning objectives was to self-assess their understanding of the content by engaging in active recall to identify any gaps in knowledge. Based on this behavior, the students could then adjust their framework for studying to focus on high-yield material (i.e., material they anticipated would be assessed) or create their own additional study tools.

"Write practice questions; use for active recall." (Record ID M1-74)

"I made a bulleted list with the learning objectives and added info below to 'answer' the objective." (Record ID M2-04)

"I use them to alter how I will study." (Record ID M2-128)

Sub-theme 2B: Students do not use learning objectives for a variety of reasons. Responses indicating neglecting to use learning objectives followed questionnaire branching logic which asked for reasons for not using learning objectives. Responses described learning objectives as not being helpful for reasons such as being too broad, vague, or numerous as illustrated by the following quotes:

"They're too broad to study. They usually include every detail in the slides. We're tested on small details so they don't work. They're basically an outline of their lecture." (Record ID M1-55)

"I guess I should but they always seem so hard to grasp or too vague to be useful like 'students will know how to do a respiratory exam' which to me is like saying 'know everything'." (Record ID M2-47)

"Often times the objectives are redundant with the most blatantly presented material or there are too many so you have to learn it all anyway." (Record ID M1-70)

Additionally, there were students who indicated they did not find learning objectives helpful because they found learning objectives to be detrimental to their success. These included descriptions of an increased cognitive load (e.g., amount of information) and feelings of being overwhelmed, stressed, or anxious. Record ID M1-13 said they did not use learning objectives "because [learning objectives are] to [sic] spread out and stressful" while Record ID M2-58 echoed this with stating how learning objectives are "overwhelming to consider since I have no prior knowledge of the content."

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Record ID M1-89 even stated learning objectives “don’t always clearly define what we need to know, so can hurt more than they help”.

Another reason students indicated they did not use learning objectives was because they found other resources to be more helpful. These resources were described as internal or external to the course but were largely used to assess the student’s understanding of material as described below:

“Practice exams gauge my comprehension much better than simply answering a learning objective.” (Record ID M1-06)

“So far, high yield outside resources have guided me to high yield class topics.” (Record ID M2-125)

Students also indicated that they did not use learning objectives due to a perceived curricular misalignment. Some responses described failure to meet an expectation for the learning objective to be all-inclusive regarding assessable content, such as the statements below:

“I typically don’t take time to read the learning objectives because I assume I am responsible for everything presented in class and sometimes information not presented. Although we have objectives, I often feel I must learn information outside of the objectives.” (Record ID M2-20)

“They do not help as professors test many things outside of learning objectives.” (Record ID M1-132)

Additional responses described students acknowledging they could not identify how the presented content related to a learning objective.

“Unsure of their relevance.” (Record ID M2-21)

“Sometimes I don’t know how strongly the assessments are geared toward the objective.” (Record ID M1-63)

Other responses described a similar frustration but reported explicit misalignment between learning objective and assessment.

“I don’t think exams are built around the learning objectives usually.” (Record ID M1-139)

“Generally, they do not show a parallel between their learning objectives and the content.” (Record ID M1-80)

Theme 3: Instructor communication about learning objectives is varied

This final theme was generated based on responses which described the variation of perceived communication from instructors regarding learning objectives. This theme was further organized into four sub-themes to describe different elements of communication.

Sub-theme 3A: Timing of communication. The first sub-theme captured responses to inquiry about when instructors communicated about learning objectives to these students.

Branching logic dictated response to this question only if the respondent indicated communication about learning objectives did occur. Responses were diverse but included introductory timepoints for the respective course or learning session as indicated by the following:

“On the first day of class” (Record ID M1-97)

“Right before lecture begins, they typically go over them briefly.” (Record ID M2-27)

Conversely, some respondents indicated this communication only occurred when the instructor was prompted as described by Record ID M1-26 stating, “Typically not until someone asks if they are followed”.

Sub-theme 3B: Method of communication. Students also indicated the method of communication regarding learning objectives was varied, but broadly fell into categories of verbal, written, or a combination thereof. This variation was described between courses and instructors.

“They tell us ‘Here’s the objectives’ or some will read them.” (Record ID M2-18)

“Put [learning objectives] in canvas [sic] or at the front of a PowerPoint...” (Record ID M1-61)

Sub-theme 3C: Suggested Uses. The questionnaire also asked students if there were specific things communicated about learning objectives regarding instruction on how to use them as a student. These suggested uses encouraged development of metacognitive habits and promoted higher order thinking such as application or synthesis of information.

“Instructors just tell us to be able to apply the knowledge gained from objectives.” (Record ID M1-32)

“Read them to make sure you have mastered them. Use them as a checklist.” (Record ID M2-20)

Sub-theme 3D: Instructors do not communicate about learning objectives. The last sub-theme was created to encompass responses indicative of a perception from respondents that their instructors did not communicate about learning objectives to the students. This included brief responses such as Record ID M1-93 stating, “they usually don’t”. This sub-theme also included responses which described how the instructor may acknowledge the existence or appearance of learning objectives but does not discuss anything further. The quotes below illustrate this occurrence:

“They don’t, they just say ‘these are the learning objectives’” (Record ID M2-50)

“[Instructors say] ‘here are the objectives; I won’t read them to you, but you can on your own time.’” (Record ID M2-106)

Discussion

This study provides insight into how pre-clerkship medical students perceive learning objectives, including thoughts on their value and how they are used. Data revealed that the majority of students (59.7%) did not use learning objectives for their basic science courses even though nearly all students (98.5%) indicated they were aware that learning objectives were available. Notably, the sampled students shared several constant variables including instructors, courses, and learning environments respective to each cohort, but *p*-values suggest there may be additional unidentified factors driving these students' choice to not use learning objectives. Similarly, the qualitative data revealed stark contrasts in developed perceptions regarding learning objectives which may lead to identifying the driving factor(s), but further research is necessary.

Students who indicated that they use learning objectives largely described using them as tools to aid in guiding their studies in several ways. First, students indicated learning objectives provide guidance as to what content or concepts should take priority, often described as "high yield". Additional uses described metacognitive habits such as using the learning objectives to self-assess their understanding of the knowledge and identify gaps which may exist (Tanner, 2012). This allowed the student to reiteratively restructure their study approaches to best address these gaps in knowledge to ensure ample preparation for the future assessment. These students may have utilized learning objectives prior to entering medical school, and potentially were already practicing metacognitive strategies for their learning, although this was not confirmed with the current study.

Students who indicated they did not use learning objectives provided several reasons for not using them. One deterring factor expressed was encountering a perceived curricular misalignment. This was frequently described as the student feeling as though the presented learning objective was not tested during the subsequent assessment. This led to feelings of frustration and mistrust, as expressed in the data and the literature (Leone et al., 2019). Curricular misalignment can also lead to feelings of an academic version of learned helplessness in which the student feels as though their study efforts do not matter and will not make a difference toward their inevitable poor performance on the assessment (Filippello et al., 2019; Fincham et al., 1989). Development of these negative feelings toward learning may also harm the development of a growth mindset and skills related to life-long learning, such as self-directing and self-regulating (Husmann et al., 2018).

Further investigation is necessary to determine whether curricular misalignment truly exists or if other factors may contribute to the students developing this perception. One possibility could be the lack of formal pedagogical training

of medical educators (AAMC, 2022). If the educators do not know how to use learning objectives to achieve curricular alignment, there is a possibility for them to present content outside of the students' scope or create invalid assessment items (Alsheikh, 2014; Ferguson, 1998). Additionally, the educators may not consider how students might use learning objectives and neglect to incorporate them into the teaching and learning activities. Lastly, a possible contributing factor may be what is known as the "curse of knowledge" (Wiemann, 2007). This phenomenon occurs when the educator possesses an unconscious understanding of foundational knowledge and may not recall what it was like when they did not. This can result in the omission of information which is foundational and necessary for students to form connections between presented content (Leone et al., 2019; Wiemann, 2007). Similarly, this may also result in educators being able to quickly identify linear relationships between content and learning objectives whereas students cannot.

Lastly, the sampled medical student perceptions of communication from their instructor regarding learning objectives reflects trends observed in other student populations (Osueke et al., 2018). This includes descriptions of both general communication wherein the instructor encouraged the use of learning objectives and specific communication wherein the instructor describes detailed ways to interact with learning objectives to aid learning. Given that each cohort in this study shared the same environment and instructors, further investigation is necessary to identify what factors may have contributed to discrepancies in student perception of communication from instructors.

Limitations

The authors acknowledge several limitations of this study. The first is that these students were only sampled at one given time-point. Student opinions could have been biased by a recency effect, particularly if the given instructor may have specifically pointed out learning objectives that day. Students may have also interpreted and responded to questions specifically in reference to the course during which they were sampled (i.e., medical histology and cell biology learning objectives for first-year students and medical microbiology and immunology for second-year students) instead of with respect to all of their basic science courses. Second, the nature of the questionnaire limited the depth of response. Students were prompted to explain their ideas, but time and space limitations may have limited their responses. Future study could allow for interviews or focus groups to allow for probing questions and deeper responses. Finally, the authors limited this study to pre-clerkship basic science courses. They acknowledge that opinions on learning objectives will vary with the context and are careful not to generalize outside of the pre-clerkship population that was studied here.

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Future Directions

Further investigation into the perceptions of learning objectives by pre-clinical medical students is necessary to more accurately identify causative reasons for neglecting to use learning objectives. More specifically, parsing and analyzing data respective to cohort might reveal significant differences between or perceptions unique to each. Additional expansion to include other student populations and institutions would provide insight to developing more effective approaches to creating and implementing learning objectives. Comparing student perceptions to those held by teaching faculty would be valuable to identify potential miscommunications surrounding learning objectives. Finally, comparisons between medical student groups that use or do not use learning objectives and their respective performance on various assessments would lend insight to the practical value of learning objectives.

Conclusion

This study suggests that pre-clerkship medical students may not use learning objectives for various reasons. By allowing these students to describe reasons for why they do not use learning objectives, the researchers have gained insight into potential areas of improvement regarding implementation of learning objectives in pre-clerkship medical education. This data can be used to explore other student populations (i.e., other health profession students) and compare experiences with learning objectives between disciplines. Additionally, this study found that pre-clerkship medical student perceptions of communication regarding learning objectives were similar to what has been found in other student populations. Further study is required to identify causative factors which contribute to students developing different perceptions of instructor communications.

About the Authors

Kayla Pavlick is an Assistant Professor at the University of South Alabama and was a graduate student in an anatomical sciences education program at the University of Mississippi Medical Center at the time of this study. She was responsible for the conceptualization, methodology, data analysis, and writing of the manuscript in partial fulfillment of their dissertation. Casey Boothe is an Assistant Professor at the University of Mississippi Medical Center and was involved with the methodology, data analysis, and manuscript editing. Andrew Notebaert is an Associate Professor and Program Director at Northern Illinois University and contributed to the conceptualization, methodology, data analysis, and manuscript editing.

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Appendix 1. Student Questionnaire

Please **CIRCLE** your answer choices for the following questions.

1. Please indicate your age range:

- a. 20-23
- b. 24-37
- c. 28-31
- d. 31-35
- e. Over 35

2. Please indicate your race:

- a. African American
- b. Asian
- c. Caucasian
- d. Hispanic
- e. Other (Please specify: _____)
- f. Prefer not to answer

3. Please indicate the highest level of education you have completed:

- a. Bachelor's Degree
- b. Master's Degree
- c. Doctoral Degree
- d. Other (Please specify: _____)

4. Are you familiar with the term "Learning Objective"?

- a. Yes
- b. No

5. What do you think a learning objective is?

6. Do you know if there are learning objectives available for your basic science courses?

- a. Yes
 - i. Where do you typically find them?

- b. Not sure (proceed to question 8)
- c. No (proceed to question 8)

7. Do you use the learning objectives in your basic science courses?

- a. Yes
 - i. Please describe how you use these learning objectives:

- b. No
 - i. Why not?

8. Prior to entering medical school, were learning objectives available for your typical courses?

- a. Yes
- b. No
- c. Not sure

continued on next page

9. Prior to entering medical school, did you know how to use learning objectives?

- a. Yes
- b. No
- c. Somewhat

10. Have your basic science instructors communicated how to use their learning objectives?

- a. Yes
- b. No (please omit questions 11, 12, and 13)

11. **WHEN** do your instructors communicate to you about learning objectives?

12. **HOW** do your instructors communicate to you about learning objectives?

13. How do your instructors tell you to **USE** their learning objectives?

Thank you for participating in this study. The researchers at UMMC value your contribution to the education research conducted at UMMC.

Please DO NOT put your name on any part of this questionnaire when you turn it in.



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