3. MPEX-II Survey

Here are 25 statements (Items 1-25), which may or may not describe your beliefs about this course. You are asked to rate each statement by selecting a response between A and E where the letters mean the following:

A: Strongly Disagree	B: Disagree	C: Neutral	D: Agree	E: Strongly Agree

Answer the questions by filling in the bubble on the scantron for the letter that best expresses your feeling. Work quickly. Don't over-elaborate the meaning of each statement. They are meant to be taken as straightforward and simple.

If you do not understand a statement, leave it blank. If you understand, but have no strong opinion one way or the other, choose C. If an item combines two statements and you disagree with either one, choose A or B.

1.) Learning physics will help me understand situations in my everyday life.

2.) All I need to do to understand most of the basic ideas in this course is just go to lecture, work most of the problems, read the text, and/or pay close attention in class.

3.) The main point of seeing where a formula comes from is to learn that the formula is valid and that it is OK to use it in problems.

4.) When learning a new physics topic it's important to think about my personal experiences or ideas and relate them to the topic being analyzed.

5.) In this course, adept use of formulas is the main thing needed to solve physics problems effectively.

6.) Knowledge in physics consists of many pieces of information, each of which applies primarily to a specific situation.

7.) If I don't remember a particular equation needed for a problem in an exam I can probably figure out an (ethical!) way to come up with it, given enough time.

8.) Physics is related to the real world, but I can understand physics without thinking about that connection.

9.) "Problem solving" in physics basically means matching problems with facts or equations and then substituting values to get a number.

10.) In this course, I do not expect to understand equations in an intuitive sense; they just have to be taken as givens.

11.) When doing practice problems for a test or working on homework, if I came up with two different approaches to a problem and they gave different answers, I would not worry about it; after finding out the right answer, I'd just be sure to avoid the incorrect approach.

12.) My grade in this course will be primarily determined by how familiar I am with the material. Insight or creativity will have little to do with it.

13.) Often, a physics principle or theory just doesn't make sense. In those cases, you have to accept it and move on, because not everything in physics is supposed to make sense.

14.) If a problem on an exam does not look like one I've already done, I don't think I would have much of a chance of being able to work it out.

15.) Tamara just read something in her physics textbook that seems to disagree with her own experiences. But to learn physics well, Tamara shouldn't think about her own experiences; she should just focus on what the book says.

16.) The most crucial thing in solving a physics problem is finding the right equation to use.

17.) When handing in a physics test, you can generally have a correct sense of how well you did even before talking about it with other students.

18.) To really help us learn physics, professors in lecture should show us how to solve lots of problems, instead of spending so much time on concepts, proofs of general equations, and one or two problems.

19.) A significant problem in this course will be being able to memorize all the information I need to know.

20.) If physics professors gave really clear lectures with plenty of real-life examples and sample problems, then most good students could learn those subjects without having to spend a lot of time thinking outside of class.

21.) Although physical laws may apply to certain simple situations like we see in class and lab, they have little relation to what I experience in the real world.

22.) Group work in physics is beneficial only if at least one person in the group already understands and knows what they are talking about.

23.) When solving problems, the key thing is knowing the methods for addressing each particular type of question. Understanding the "big ideas" might be helpful for specially-written essay questions, but not for regular physics problems.

24.) To understand physics, the formulas (equations) are really the main thing; the other material is mostly to help you decide which equations to use in which situations.

25.) It wouldn't matter if I didn't get my homework returned to me as long as I knew which questions I got wrong and I had the solutions to study.

26.) Two students are talking about their experiences in class:

Meena: Our group is really good, I think. We often spend a lot of time confused and sometimes never feel like we have the right answer, but we all listen to each other's ideas and try to figure things out that way.

Salehah: In our group there is one person who always knows the right answer and so we pretty much follow her lead all the time. This is a great because we always get the tasks done on time and sometimes early.

(a) I agree almost entirely with Meena.
(b) Although I agree more with Meena I think Salehah makes some good points.
(c) I agree (or disagree) equally with Meena and Salehah.
(d) Although I agree more with Salehah, I think Meena makes some good points.
(e) I agree almost entirely with Salehah.

27.) In the following question, you will read a short discussion between two students who disagree about some issue. Then you'll indicate whether you agree with one student or the other.

Tracy: A good physics textbook should show how the material in one chapter relates to the material in other chapters. It shouldn't treat each topic as a separate "unit," because they're not really separate.

Carissa: But most of the time, each chapter is about a different topic, and those different topics don't always have much to do with each other. The textbook should keep everything separate, instead of blending it all together.

With whom do you agree? Read all the choices before choosing one.

(a) I agree almost entirely with Tracy.
(b) Although I agree more with Tracy, I think Carissa makes some good points.
(c) I agree (or disagree) equally with Carissa and Tracy.
(d) Although I agree more with Carissa, I think Tracy makes some good points.
(e) I agree almost entirely with Carissa.

28.) Let's say a student has limited time to study, and therefore must choose between the following options. Assuming the exam will be a fair test of understanding, and assuming time pressure during the exam isn't an issue, which option should the student choose?

(a) Learning only a few basic formulas, but going into depth with them.
(b) Learning all the formulas from the relevant chapters, but not going into as much depth.
(c) Compromising between (a) and (b), but leaning more towards (a).
(d) Compromising between (a) and (b), but leaning more towards (b).
(e) Compromising between (a) and (b), midway between those two extremes.

29.) Some people have 'photographic memory', the ability to recall essentially everything they read. To what extent would photographic memory give you an advantage when learning physics?

(a) It would be the most helpful thing that could happen to me
(b) It would help a lot
(c) It would help a fair amount
(d) It would help a little
(e) It would hardly help at all

30.) Consider the following question from a popular textbook:

"A horse is urged to pull a wagon. The horse refuses to try, citing Newton's 3rd law as a defense: The pull of the horse on the wagon is equal but opposite to the pull of the wagon on the horse. 'If I can never exert a greater force on the wagon than it exerts on me, how can I ever start the wagon moving?' asks the horse. How would you reply?"

When studying for a test, what best characterizes your attitude towards studying and answering questions such as this?

(a) Studying these kinds of questions isn't helpful, because they won't be on the test.
(b) Studying these kinds of questions helps a little bit, but not nearly as much studying other things (such as the problem-solving techniques or formulas).
(c) Studying these kinds of questions is fairly helpful, worth a fair amount of time.
(d) Studying these kinds of questions is quite helpful worth quite a lot of my time.
(e) Studying these kinds of questions is extremely helpful, worth a whole lot of my study time.

31.) Roy and Theo are working on a homework problem.

Roy: "I remember in the book it said that anything moving in a circle has to have a centripetal acceleration."
Theo: "But if the particle's velocity is constant, how can it be accelerating? That doesn't make sense."
Roy: "Look, right here, under 'Uniform Circular Motion' – here's the equation, $a=v^2/r$. That's what we need for this problem."
Theo: "But I know that to have an acceleration, we need a change in velocity. I don't see how the velocity is changing. That equation doesn't seem right to me."

If you could only work with one of them, who do you think would be more helpful?

(a) Roy would be much more helpful.
(b) Roy would be a little more helpful.
(c) They would be equally helpful.
(d) Theo would be a little more helpful.
(e) Theo would be much more helpful.

32.) Several students are talking about group work.

Carmela: "I feel like explaining something to other people in my group really helps me understand it better."

Juanita: "I don't think explaining helps you understand better. It's just that when you can explain something to someone else, then you know you already understood it."

With whom do you agree? Read all the choices before choosing one.

(a) I agree almost entirely with Carmela.
(b) Although I agree more with Carmela, I think Juanita makes some good points.
(c) I agree (or disagree) equally with Juanita and Carmela.
(d) Although I agree more with Juanita, I think Carmela makes some good points.
(e) I agree almost entirely with Juanita.

MPEX-II Category groupings

The items are divided into clusters according to the intent of the researchers. Note these are not necessarily functionally independent. They are not intended to be orthogonal factors. The indented topics below the main categories of coherence, concepts, and independence are sub-categories.

Coherence: The extent to which the student sees physics knowledge as coherent and sensible as opposed to a bunch of disconnected pieces.

3, 4, 6, 8, 10, 13, 15, 19, 21, 23, 27, 28

Coherence-math: Coherence between math formalism and physics intuitions and concepts. 3, 10, 28

Coherence-reality: Coherence between what's taught in the classroom and what's experienced in the real world. 4, 8, 15, 21

Coherence-other: Everything else. Similar to MPEX-I coherence. 6, 13, 19, 23, 27

Concepts: The extent to which students see concepts as the substance of physics -- as opposed to thinking of them as mere cues for which formulas to use.

5, 9, 16, 18, 19, 23, 24, 28, 30

Independence: The extent to which the student sees learning physics as a matter of constructing her own understanding rather than absorbing knowledge from authority. Similar to MPEX-I independence.

2, 7, 11, 12, 14, 17, 20, 22, 25, 29, 31, 32

Independence-epistemology: The aspect of independence that relates to the student's view of the nature of the knowledge being learnd. 2, 11, 12, 20, 22, 25, 29, 31, 32

Independence-personal: The self-efficacy the student feels about her ability to construct understanding as opposed to just accept what the instructor says. 7, 14, 17