

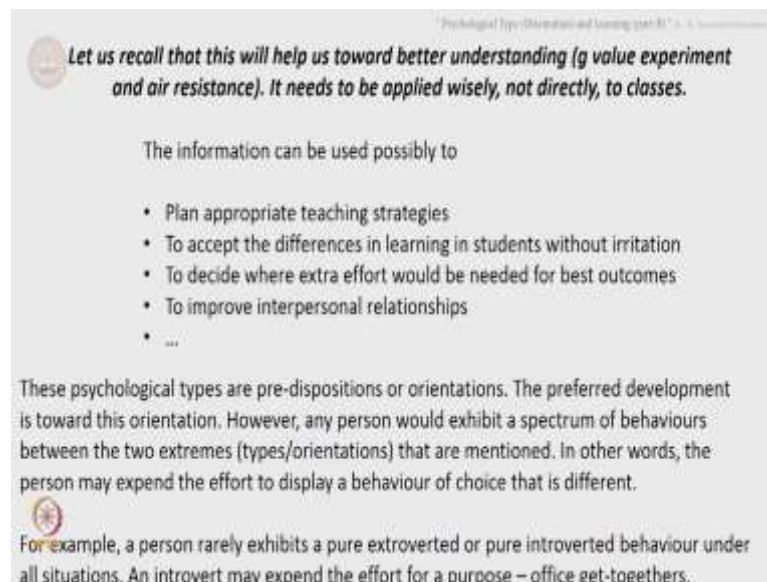
Effective Engineering “Teaching” in Practice
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Lecture – 11b
Psychological Type (Orientation) and Learning – (part – B)

Welcome back to this course on Effective Engineering Teaching in Practice. We are in a large chapter right now, where we are looking at how to access the very useful information in terms of understanding that is already available in the literature. We are bridging or building a bridge to do so. This contains 4 parts A B C D if you want to call it so, I have not explicitly called it that here, A part was the class as a whole where we started out with a practical aspect and then slowly moved to the theoretical aspects of that.

Now, B, C and D would be fully theory. As you can see these theories are widely applicable and we can use it whichever way we want to improve the learning of students. The B part is going to be psychological type or orientation as it is called and learning.

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Let us recall that this will help us toward better understanding (g value experiment and air resistance). It needs to be applied wisely, not directly, to classes.

The information can be used possibly to

- Plan appropriate teaching strategies
- To accept the differences in learning in students without irritation
- To decide where extra effort would be needed for best outcomes
- To improve interpersonal relationships
- ...

These psychological types are pre-dispositions or orientations. The preferred development is toward this orientation. However, any person would exhibit a spectrum of behaviours between the two extremes (types/orientations) that are mentioned. In other words, the person may expend the effort to display a behaviour of choice that is different.

For example, a person rarely exhibits a pure extroverted or pure introverted behaviour under all situations. An introvert may expend the effort for a purpose – office get-togethers.

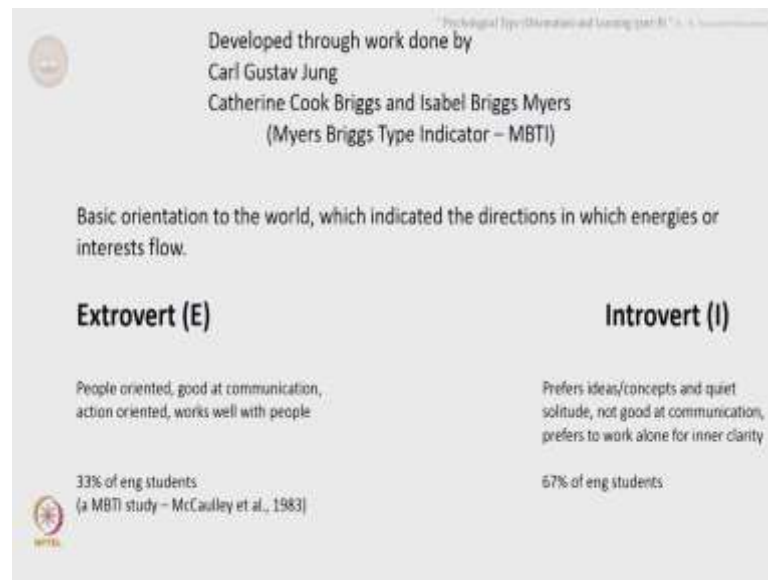
Before we get into this, let us recall that such an approach will help us toward better understanding, recall the acceleration due to gravity, the g value experiment, in an actual situation you may not be able to see very immediately that the g value is a same, but as a concept it is applicable, widely useful and so on so forth.

Therefore, these theories frameworks and so on so forth need to be applied wisely and not directly to practical situation such as teaching classes, please keep this in mind. The information can be used possibly to plan appropriate teaching strategies, to accept the differences in learning in students without irritation, it is the huge plus point, because we already know that this is going to be the case, once we know this is the case we are expecting it to happen. So, we would not get irritated to decide where extra effort would be needed for the best outcomes, because we understand the frameworks which are widely applicable. To improve interpersonal relationships because we understand what is happening here, it is similar to understanding the relationship between people in general, the same context here and so on so forth.

To here we are looking at psychological types or orientations, these psychological types are pre-dispositions or orientations. The preferred development is toward the orientation, a particular orientation that is given here; however, any person would exhibit a spectrum of behaviors that we all know, what we find in reality is going to be a mix of these concepts, spectrum of behaviors between the 2 extremes or type orientation that is mentioned.

In other words the person may expend the effort to display a behavior of choice that is different. What naturally comes to the person is something, where as a person if he or she puts in the effort can display another behavior altogether or a different version or a different shade of that behavior, that is always there, that always happens in reality. For example, a person rarely exhibits a pure extroverted or a pure introverted behavior, these are terms at a well-known, we will again look at it, exhibits a pure extroverted or a pure introverted behavior under all situations. An introvert may expend the effort for a particular purpose. Suppose the person wants to interact better with his or her colleagues and therefore, goes to office get-togethers and there, the person might make an effort although it is not natural to be an extrovert, the introvert may make an effort to become an extrovert or display extroverted behavior.

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So, this psychological type was developed predominantly through work done by Carl Jung, Carl Gustav Jung and Catherine Cook Briggs and Isabel Briggs Myers, mother and daughter pair, it is called the Myers Briggs; Briggs Myers type indicator MBTI, it is a popular indicator. So, remember these give the extremes, these give the theoretical frameworks there are 4 such things let us start looking at them one by one.

The basic orientation to the world which indicated the directions in which energies or interest flow is the first category, it could either be an extrovert or an introvert. As we all know, extroverts are people oriented, good at communication, action oriented they work well with people. Whereas, an introvert prefers ideas, concepts, and quite solitude not very good at communication, prefers to work alone for inner clarity. These are the; they are just there, no judgments that we making here, they are just there.

Somebody did a MBTI, the Myers Briggs type indicator study in 1983, McCauley et al and they found that 33 percent of engineering students are extroverts and 67 percent are introverts. So, either type - the extrovert or the introvert and the introvert they perceive the world.

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Psychological Type (Orientation and Learning style) * A. A. Aswathreddy

Either type perceives the world and consciously processes information through either

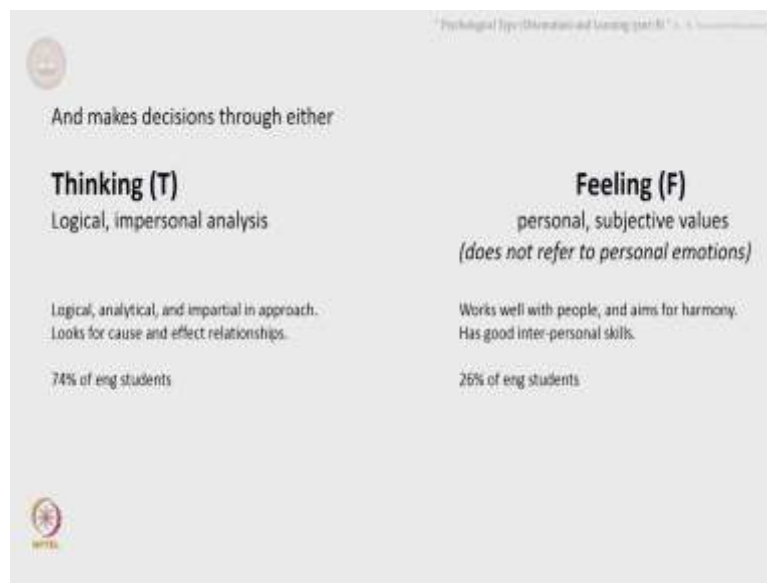
| the Senses (S) | by intuition (N) |
|---|---|
| Works with the input from the 5 senses. Prefers steady, patient work, with a step-by-step approach and analysis through well-established methods. Wants precision. | Works through inspiration, with imagination. Looks at possibilities. Work is jumpy, non-routine, imprecise. Creative. |
| 53% of eng students | 47% of eng students |

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And once they have perceived the world, they consciously process information through either their senses, abbreviated as S or by intuition abbreviated as N. What do we mean by that? They, these S people work with the input from the 5 senses, they prefer steady patient work with a step by step approach and analysis through well established methods. And they want precision, whereas people or a person with an N kind of an orientation, he or she works through inspiration with imagination, looks at possibilities, work is jumpy, non-routine, imprecise and creative and the same study showed that 53 percent of engineering students are S type whereas, 47 percent are N type.

So, they have interacted with the world, they have perceived the world. And now they make decisions about what they have perceived through either thinking T or feeling F.

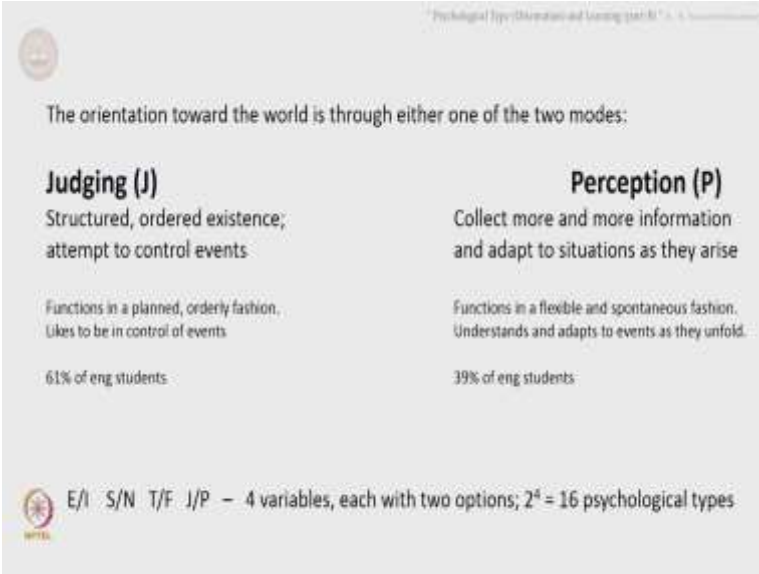
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Be a little careful here, thinking is quite straightforward logical impersonal analysis. Whereas, feeling is personal subjective values, does not refer to personal emotions. This is not related to emotions anger and so and so forth, but personal and subjective values. The T type are logical, analytical and impartial in approach, they look for cause and effect relationships whereas, the F people work well with people, other people and aim for harmony and they have good interpersonal skills.

And the same study showed that 74 percent of engineering students, no surprise there are of the T type and 26 percent are of the F type.

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Psychological Type (Orientation and Learning style) * A. A. Socioeconomic

The orientation toward the world is through either one of the two modes:

| Judging (J) | Perception (P) |
|---|--|
| Structured, ordered existence; attempt to control events | Collect more and more information and adapt to situations as they arise |
| Functions in a planned, orderly fashion. Likes to be in control of events | Functions in a flexible and spontaneous fashion. Understands and adapts to events as they unfold |
| 61% of eng students | 39% of eng students |

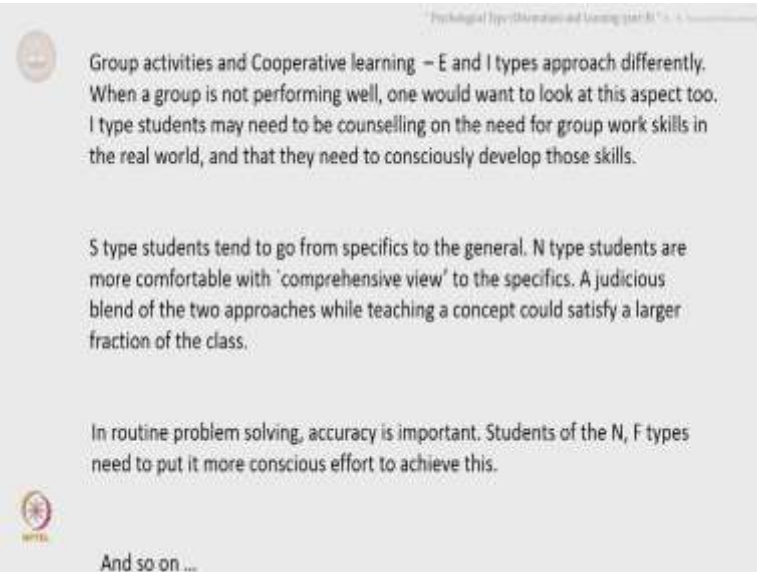
E/I S/N T/F J/P – 4 variables, each with two options; $2^4 = 16$ psychological types

Now, they have perceived, they have they have made sense and they have processed the information and the orientation toward the world is either, is through either one of the two modes, judging J type or perception P type. J type are structured, they prefer ordered existence, they attempt to control events. The P type collect more and more information as they go along and adapt to situations as they arise.

The J type function in a planned orderly fashion, they like to be in control of events, the P type function in a flexible and spontaneous fashion, understand and adapt to events as they unfold. 61 percent of engineering students are of the J type and 39 percent are of the P type in that study, it was a large study including a simple large number of students and this is what they found.

So, we have these 4 different types, extroverted introverted, sensing intuition they either are the thinking or the feeling type, they process the information through thinking or feeling and then they interact with the world back again through a J or a P type judging or perception. So, there are 4 variables here each with 2 options and therefore, there are $2^4 = 16$ psychological types, ESTJ ENTJ and so and so forth, you could have the various types and this is what the Myers Briggs type indicator MBTI gives one actually. Why is this relevant here?

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Group activities and Cooperative learning – E and I types approach differently. When a group is not performing well, one would want to look at this aspect too. I type students may need to be counselling on the need for group work skills in the real world, and that they need to consciously develop those skills.

S type students tend to go from specifics to the general. N type students are more comfortable with 'comprehensive view' to the specifics. A judicious blend of the two approaches while teaching a concept could satisfy a larger fraction of the class.

In routine problem solving, accuracy is important. Students of the N, F types need to put it more conscious effort to achieve this.

And so on ...

Group activities and Cooperative learning in that, the E and I types approach very differently. When a group is not performing well for example, one would want to look at this aspect also, once you have an understanding you know that this is going on. So, let us look at it this way.

The I type students when may need to be counseled, may need to be counseled on the need for group work, because they are not group work oriented in the real world, the need for group work skills in the real world. And that they need to consciously develop these skills, it is not natural for them, they need to develop this. This can be told to them once you understand this is what is happening.

Another situation the S type students tend to go from specific to general, the N type students are more comfortable with comprehensive view to the specifics. The direction in which they process the information is that way, a judicious blend of the 2 approaches while teaching a concept would satisfy a larger fraction of the class, it is very likely that you have a mix of these types in a classroom.

So, a judicious blend you say one way once and then when you repeat it, we typically repeat things, especially the important concepts, when we repeat it you repeat it the other way round such that the other oriented type gets it more easily than the first oriented type and so and so forth.

In routine problems solving, this is another situation where you could use, accuracy is important, we all know that students of the N F types need to put in more conscious effort to achieve this right. You see how this can be used this, fundamental information can be used for our own engineering education means, that is what I meant and so and so forth. So, I think that is what we had here. To very briefly summarize this part of with the B part, we look at the psychological type or the orientation; there were 4 different categories and therefore, there are 2^4 , 16 types knowing the psychological orientation would help us improve the learning of a large number of students simultaneously, if you can devise such strategies. Some specific instances of where it could come in handy in an engineering classroom we saw. Let us take this further when we meet again next, see you.