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A CONVERSATION ON INSTRUCTIONAL DESIGN WITH ROBERT GAGNÉ AND DAVID MERRILL NO:2

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Abstract:
The purpose of the study is to bring in the second part of diachronic conversation on instructional design with Robert Gagné and David Merrill to transcripts. This conversation was hosted by Utah State University, in the United States of America, in July 10, 1989. Throughout the history of instructional design, these two scientists are considered as the pioneers of the field and in these sessions, they summarize and compare their studies.

Keywords: Gagné, Merrill, Conversation, Instructional design

1. Instruction

Robert Gagné was the most important name in the field of instructional design area. He followed by many researchers and scientists. Like David Merrill ve Charles Reigeluth. Merrill's Component Display Theory, Reigeluth's Elaboration Theory have some marks from Gagné s work.

2. Method

Conversation videos are not commercial. Utah State University made open acccess to find them at https://archive.org/details/ConvInstDesign. So those videos are dowloaded. Transcripts are created.

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3. Findings

Don Smellie: I am Don Smellie, professor of education and head to the Instructional Technology department at Utah State University. Recently we hosted a conversation on instructional design with Doctor Robert Gagne from Florida State University and Doctor M. David Merrill at Utah State University. Now, neither of these individuals needs an introduction. Doctor Gagne is among the most prominent names in our field and considered by many as the father of instructional design as we know it today. Objectives, hierarchies, and the conditions of learning form the theoretical foundation upon which many have built in designing and developing instructional products. Doctor Merrill has based much of his efforts on Doctor Gagne's work. He has elaborated areas which he felt needed more detail. Component display theory and elaboration theory are recognized as major contributions to the field of instructional technology. Together Doctor Gagne and Doctor Merrill represent fundamental theoretical focal points upon which much of what we know about instructional design is based. These two prominent theorists have cooperated and shared their views before but never before in such a lasting and personal way as you are about to see. This is a video transcription with minimal editing. It is not a commercial studio production but a working transcription of the live proceedings. You should have also received a graphics package which contains the visuals used with other supporting materials that were distributed during the conference. As you will see, the agenda acted as a guide rather than a blueprint. Now don't be alarmed that many have the graphics and agenda items are not mentioned are used during the discussion. We are richly rewarded by the content that they choose to address. In this second session, doctor Gagné and Doctor Merrill examine some of the differences between their views. In so doing we find the Doctor Gagné's learning hierarchies are similar in many ways to Doctor Merrill's content structures. They also identify some similarities between the events of instruction and primary presentation forms. I think you'll find the exchange of ideas in this session most interesting. Let's join session two now in progress.

Merrill: I went through some of the notes that I've made in the margins of my copies of the conditions of learning which I have here and my copy of Gagné and Briggs and I brought all these things along about so we can look them. The last time I did this with Bob he did this to me. I just want to get back at it for a long time. He walked into the room we did this ten years ago at Florida State University in a much less formal way and as we walk down there Bob take a paper that I had written and throw it on the desk and he said all right he said I brought the Bible. So I want to say Bob I brought the

Bibles today. So we can go from there. Anyway! Based on these Bibles and other papers that I had of Bob's, I went through to try to look at what some of the differences were. I've already acknowledged you know starting with his haircut right on down I've admired Bob for a long time and I didn't know that I get such a big laugh button, people love to laugh at deformities, had some this whatever, anyway, I've been a great admirer of Bob Gagné for a long time and much of my work is really been modeled on his quite seriously, and so I know your first talking about this some of the promoters at the university so I'll talk about this is a debate and when bob and I thought we said now we really don't see this as a debate and we don't see the differences as major theoretical differences there was no intent on my part ever to create an alternative theory. In fact there was no intent on my part to create a theory just sort of happened accidentally. I started to write some papers and pretty soon people start to quote papers and I remember one day at I was a Brigham Young University a group of us were talking around in the work that we were doing had all kinds of labels, we did a paper for the navy those call the instructional strategy diagnostic profile and so people started call the ISDP and that was sort of it an awkward name and so actually we had a brainstorming session some other people were in that session and other people were be where you at the time we sat down and had a little meeting what happens at what we call this and component display theory at the resort came out of that and again really our attempt was really to try to extend explain we were in a very practical environment trying to use this material to the design materials design instruction one of the big projects in those days was the ticket system and those are not aware the ticket was one of the first big authoring systems is created before they even knew about the personal computers and on the ticket system we had a lot of debate for a long time, how we were going to do that system and what was going to happen and since I was simultaneously trying to work on a paper for the first reviewed research and education I published a paper in their call instructional design methodology in research which had very little root with research little root with methodology really was an attempt to present the first version of kind a component display theory and that's where we first separated content from performance and other kinds of things. So we were trying it find a practical way to design an authoring system on ticket and at the same time we were trying to formalize some of these ideas. Well over the years there's been a lot of evolution and if you read that first paper it means a little bit like a sophomore paper because it's full of esoteric words and time has gone on I become less concerned about impressing my colleagues and more concerned with communication to those that are actually try to do research and so we've changed words like identities to facts that we've changed like expository generality to rules and consequently loss some of the

communication but also has lost some other the jargonism. And anyway, over the last couple weeks I've looked at again in detail some of the work that Bob did and try to identify what I thought were significant differences that might really be places where we really different, what are areas where there really kind a same. I guess I have a personal goal for the outcome of this discussion. I think we need to help promote the field of instructional design. It waxes and wanes in terms of its popularity and people involved in I've often advocated in this is a good group to advocate too that we need more people who are concerned with instructional design theory. I certainly have no desire to be seen as the theorist or you know this is the theory to use I'm more concerned with how do we make this whole enterprise practical how do we get to the point where we can design effective instruction and I am concerned that there's a lot of lousy instruction around and that we need to do things my motivation really is start a long time ago as a missionary for the Mormon Church and I was interested in how do we create effective, how do we teach effectively and I really never deviated from that kind of a goal. So I hope the outcome of all of this as we look at these differences is not you know this is better this is worse but some reconciliation in a way that can lay a foundation on which future theorists can build and we can do more research and so forth.

Gagné: You reminded me something, once you have a colleague who was a superintendent of the Sunday School for a church and he decided that their instruction in this Sunday schools really not very well done not very well organized or anything else and so he attempted to introduce them to the whole notion of you know planning things by objectives. He was unable to do it. He had to give up.

Merrill: Hopefully we come up with a few things that might be useful but I don't know you know we will see. Anyway, I have I prepared Bob as seen as only briefly this morning I tried to make a list of some of the areas and this isn't one of the handouts you have, some of other areas where I thought there might be some major differences between component display theory and conditions of learning. Now, I think we're making some assumptions here on the part of the audience we're not going to go into a lot of detail of you have ever red, either Bob or my work then this next discussion make a right over your head but because we're assuming you know some of things we've said we're not going to write a review of that. But it seems to me that I didn't label the columns here, I'm sorry, the first column is really Bob's work under conditions of learning, the second column is component display theory version one and the third column is component display theory version two which nobody knows about yet. And

what we've tried to do here's identify what it seems to me or some other major differences. The dots mean that that particular theory has little to say about this or is not part of it and so the first question really is the content dimension. Bob has five categories of learning with some subdivisions and intellectual skills. We have a matrix that has content on one dimension and performance on the other. And so one of the big differences is that content dimension, and later on in the new version of component display theory content structure. We come back to these may be a minute let me just overview all of them. The second major difference it seems to me is in the organization of content. As you know the other major contribution about Gagné he has made the whole notion of cumulative learning theory or objectives hierarchies the analysis of what is that the student does in the terminal task and cause I recall in some in the early writings Bob you did as you asked the question what does the student need to be able to do given only directions to be able to do this and asking that question successively generates a hierarchy of skills and that's a very important contribution and widely used in instructional design throughout almost all formal training. But we mean with Charlie Reigeluth and I primarily and some of our colleagues challenged that notion a little and propose an alternative which came to be known as elaboration theory which looked at this whole question of sequencing a little differently and certainly looked at the notion that there may be other things then prerequisites that we need to attend to, and so that's another difference which may be more difference in emphasis then kind but at least it is a difference and then later I think we want to in anticipating this afternoon a little bit move that even further of the notion of the content structures versus objectives hierarchies and we may want to get into that a little later. The third area of difference is really not so much an area of difference and maybe we can dismiss this one in this discussion more quickly and that is Bob has made identified nine events of instruction which are carefully tied to the learning activities that take place from as identified by learning theorists and has suggested that in organizing instruction those nine events provide a guideline for checking to make sure you have all of the necessary things. There isn't a parallel type of procedure in component display theory for how to do instruction. CDT really is kind a brought theory without directions for the actual instructional design effort itself. The reason I say don't think there's a conflict here as I have no quarrel with the nine events and can certainly use the nine events in applying the CDT and maybe as this discussion goes on we'll try to show how that works for those of you there you're interested in that. The fourth idea here is really in the conditions of learning and that is a whole matrix that you have of Bob's suggestions which is only at this particular the iceberg is a lot of detail in his book the conditions of learning and it's really all of the recommendations on primary and secondary

presentation forms. Here again, there's probably less major difference then there is some difference in embassies and later we might want to identify some of the specific points that we have made that are not included in the conditions of learning and perhaps in specific points that Bob has made that we have overlooked. And finally, there's the whole question of learner control. Conditions of learning says little about learner control and we have made a major tenet of CDT and we may want to get into that issue is that the role that learner control and how important it is a reason in that. So that was my attempt to kind a look at the differences you may have on your own agenda but I thought maybe that would be a place to start and with that much introduction I have said very too much maybe more comment first.

Gagné: No. I think that's fine.

Merrill: We don't have to follow these in order.

Gagné: I know I suggest we might try to do that.

Merrill: Alright!

Gagné: Try it in that way and see what happens because these are I think certainly principal points that we want to talk about. Let me start then with the content dimension. Well, referring to component display theory, I've never been very happy with that but you know that that's that goes back a long way. I really think you know if you take the category called remember, all of these things have to be remembered I don't I don't like that word. I don't see that it distinguishes what yet apparently means is that you're remembering in the sense that the performance is one of stating something and that to me is, you see, the verbal information; that's why I don't like to mix it in with all the others. So I don't like that remember. I think that's as far as all the categories are concerned that of the things that I learned whether you're talking about concepts, rules, principles that the proper output category is use that is it use. And that's what all of my definitions and my account of each of the kinds of matter fact of all of the five kinds of outcomes that I've mentioned this morning plus their subordinate ones which are the intellectual skills of all concepts and rules. I look for their presence being displayed in use and no other way and I'd say you see I do think it is not I think it's a mistake to say you can you can remember a concept meaning by that stated or remember a rule meaning by that stated see. I see so many examples in which it's perfectly possible for people to learn statements of rules or statements of concept

definitions which they haven't the slightest idea what they mean; in other words they haven't really learned them as concepts or as rules. See a lot of people can say ohm even a simple thing like I before E except after C and then not be able to spell a word like receive or a lot of people can say well let's see if I have a preposition it takes the objective case and then they will say well just between you and I I don't believe that you see. So as far as I'm concerned I would like to restrict the categories to those of use. I don't see any I think that the other is wrong, I think that the other is wrong because its substitute a verbal information outcome which is perfectly alright by itself for an intellectual skill outcome which is a very different thing and should not be confused and should not be talked the same way and should not be particularly in terms of identifying people's performance or saying you know does he really know this, does he know this rule, does he know this principle of you want or does he know this concept. The only one way to tell that he's got to have to demonstrate this not says it, that's why I don't like remember.

Merrill: That's exactly why I have remembered in there. That you have built all the arguments that I wouldn't, let me put this up. This is an attempt you have this also sewing that look at that you are looking at. This is the same when I showed earlier but I now super imposed on this Bob's categories as I see them fitting and this combines new components displays, lots of information on this little show. And if you look and we have tipped that the other way so the content amid that on the side I am sorry we have facts, concepts, procedure, and principle and remember, use and find across the other. Now let me indicate how we came up with this separation the first place and let me defend the remember category first since that is where you have started. I agree with your argument, I mean the whole notion that people should use information seems to me very important and that when people remember a rule or stating a definition but they're not able to classify or not able to solve the problem using the rule is very evident that's exactly what let me to this distinction. On the other hand I think that it's there are learning outcomes which require only remembering. Now one of the problems we have with the English language and I guess one of the reasons I don't like the word use which I didn't use in an earlier versions of this is because it has so many connotations that obviously no matter what we're doing we're using something or likewise no matter what we're doing we are remembering something. So I guess that one way we have to take those terms which are very generic words in English language and restrict them. So for me when I use the word remember I'm really saying and in current terms, modern terms certainly wouldn't have said this when I first said it but in modern terms I would say that's really the ability to transfer a declarative net and abstract

information of that net that's what I mean by remember. Consequently in my view version I have use the term the declarative up here as I never remember. So I say if you've got a network of ideas and you have the ability to go in and paraphrase or pull out those ideas or remember the verbatim any of those things, I think those all come out of this kind of a network and I think there is a set of learning things and in fact I have put your verbal information, you know me to play, but it seems to me that what I meant by the word remember was what you mean by the word verbal information except that I would divide it into two columns which is done here and that is I have indeed remembering instances which would include facts like labels parts of a machine which are really verbatim memory or even formulas or things of that sort and I would also talk about remembering generalities which i think is worth consistent with your recent notions on verbal information.

Gagné: All that's interesting. All those interesting ideas I would have to think that one over.

Merrill: Well yeah...

Gagné: The last one. Now, otherwise you see you're saying well we really in agreement here that this whole line goes across their call remember if I think of that as declarative knowledge that they were talking about the same thing. I think we both thought all agree then then maybe.

Merrill: Okay.

Gagné: I don't know. We both are agree, we'll just call it declarative knowledge.

Merrill: Right, yeah but I would prefer a hearing the word remember and get rid of.....

Gagné: Well you see I have used the word as you know going back to the businesses of stating objectives, I've used the word state.

Merrill: Yes, I would, too.

Gagné: Well, it is not very different from declare of course and so on. For the other not use I don't know what your objection you use is but I've used the word demonstrate meaning at the individual is able to show that he can do something.

Merrill: And I use that same word back to probably borrow it from you. In our chapter on CDT we have a table for how to state objectives that they were state and demonstrate a list for procedure allowing it to them.

Gagné: Anyway, there's some coming together here.

Merrill: Yeah.

Gagné: Even the terms when one should use and quite possibly, we should follow the psychologists who are more popular than we are and use the word declaring the knowledge.

Merrill: John Anderson is a learning cognitive psychologist at Carnegie Mellon University. These are, his made these terms popular his most recent third theory.

Gagné: This is one of the reasons why remember I was answering this question about this being useful categories. But I was very impressed with the facts. There were people before Edison who did this but that some people who thought about these things thought about cognitive psychology very deeply had come to the conclusion we must have a distinction between procedural knowledge and declarative knowledge and that is one what I consider one of John Anderson's major accomplishments. He has promoted this idea that there must be a distinction between these however you look at them as performances they are different and you certainly must consider that they are organized differently in terms of their internal organization, well go ahead.

Merrill: Well I think I disagree here maybe the choice of the term remember we have used because I think I really mean by remember at least by one brought I got one other rose here but legal I roll you remember generality I mean really what you mean by verbal information.

Gagné: Okay, well going back to the other diagram, then you see I don't have any difficulty at all with the one with the line that goes across it says use that's fine. Okay and we talked that all ready. Now then, there's another one up there. What is it called?

It was a call find or I think that's kind of ……. I really think that you know when one is engaged in that kind of activity I'd say that is problem-solving, that's what I want to say about problem solving. I know somebody wrote this a couple of people wrote these articles about problem solving and problem finding. I don't know what they meant even after read the things several times that I don't know I don't know what they are talking about.

Merrill: I do not know what I mean either and I'm going to concede a minute before I can say that like to explain why it was rational to me a one-point. And that is by find what we kind of intended I agree is problem solving in your in earlier work it was modeled on your problem solving and the idea was that if you found a new definition or you found a new procedure for doing something or you found a new principal that was a former problem-solving and that's what we originally intended by that dimension. However you persuaded me that so I'm going to can see you persuaded me that cognitive strategies are different from that and so if you notice in my new version I've replaced find with your term of cognitive strategy because I agree that there needs to be a cognitive strategy and that problem-solving somewhere in between I mean in both combination of cognitive strategies and we will use it.

Gagné: Well, problem solving is a kind of activity that the learner of the performer is engaged in, you see, cognitive strategies that word I hide yes it really came from Brunner as far as I know it came from his book called the thinking, yeah, the study of thinking. Fine, so that initially cognitive strategies we're really apply almost solely to problem-solving activities and various kinds of cognitive strategies of problem solving some of which I have mentioned in all other some the general ones like break the problem down into parts and so on and as well as those which Brunner specifically talked about in which apply only to the kinds of problems that he was particularly served with. But later on it became clear that they really are strategies which the cognitive theorists called executive control processes. In other words, they were ways that the learner had of putting into effect procedures which could internally control their own internal processes and that are what I've thought of them as being as doing. Now when one has that kind of a skill or that kind of a procedure if you want then you see it applies rather generally, even applies to let's say paying attention and they are strategies that an individual can use to get himself or herself to pay attention and there are strategies in that and learner can use to you know to modify things so that they are made capable of being stored in short term memory and there are strategies of rehearsal which is another thing that comes from the cognitive psychologists and

strategists and of course many strategies of encoding and strategies of retrieval. So strategies the definition of them, the meaning of them has I think of necessity, gotten much broader. Refer to all kinds of learning and thinking processing that can be subject to some kinds of controlled by the learner, this is not learner control.

Merrill: No, no, no.

Gagné: They become executive control processes in other words and so I think the definition becomes very general, but I think this is not a difference.

Merrill: No, not a real difference, in fact I am moving more that direction. I think comments I guess maybe true. I come on earlier today in your summation you indicated that you thought these rule very simple and I guess what is a comment on that and that is I think they're simple in the same sense that Pascal language is simple, you have five commands with which you can write an infinite variety of programs and so the commands themselves are simple, but the ability to put them together into meaningful ways to really be creating are not at all simple. So I would agree with the cognitive strategies are simple but the difference between knowing what those cognitive strategies are and putting them together into a meaningful sequencing, combining with what you know in terms of rules and other things is not simple and consequently the instruction there's still a great challenge it's not just a matter of I mean it seems to me that if you teach somebody Pascal by saying this five control structures as a repeat until o a while loop and for loop and if loop, those are easy to understand and somebody can learn those in and a half an hour, but that doesn't mean they can write a program because they have no idea how to use those simple things to do exciting complex things, and I think the same thing could be set for cognitive strategy using teach the specific strategies quite quickly the ability to use those strategies in creative ways is another instructional challenge, that's comment number one.

Gagné: Well I not only think its instructional challenge I think I sometimes play with that notion that it is impossible.

Merrill: That is heredity.

Gagné: Yes...

Merrill: I look at my children I wanted that's not the case you know.

Gagné: Otherwise, I totally agree, well I think you're right you get you catch my meaning when I say that simple. I think so.

Merrill: The other comment I would make relates to my initial category of find. I think there's not complete inconsistency between what we've intended initially it seems to me that the ability to create a new definition, for example, invent a new concept if you will which I keep emphasizing to my students is an important part of science which we never talked about but in fact it reminds me of an anecdote is worthwhile I remember once giving a lecture and I was drawing a diagram on the board in the lady sitting to my left in the class said where did you get that and I said what you mean what I get that's what you get that diagram and I said well I thought it would help you understand what I'm talking about, you mean you just made that up, and I said well I haven't thought about that yeah I guess I just made that up and she stormed out I said I've never been so I never had to teach of, just make things up. And so, she left. So, I turned off the rest of the class and I said well somebody's gotta make it up why not me so but I think the idea of embedding concepts of making things up if you will is not talked very well and that's what kind of we had in mind by finding concepts and it seems to me that consistent with this latter notion is that that's the that activity is the use of cognitive strategies combined with previous knowledge to come up with new concept.

Gagné: Sure...

Merrill: Now the same argument made for coming up with new procedures or new principals. So I think the find category we had kind of leaded toward this but I like the cognitive strategy better.

Gagné: So it's okay I don't mind the category. I just think that's finding seems a little...

Merrill: Yeah I don't like find any more like I don't like term remember.

Gagné: Okay...

Merrill: But idea with these practical instruction developers out here in a you knows especially the guys that maybe they can understand four-letter words are you gotta find.

Gagné: The other comment I wanted to him make though not this previous slide was that you know in your component design theory you have gone to content structure and I do find that a most interesting idea.

Merrill: Okay well let me bring to that.

Gagné: I hope we can discuss that more thoroughly.

Merrill: Okay, let me just summarize our previous discussion by saying I think that we've agreed you may be some problem about terminology but basically on another dimension the declarative procedural cognitive strategy to mention. I don't think we have a quarrel. I think I agree with your verbal information, I agree with your intellectual skill the cognitive strategy. I think we don't have a basic on those columns or rows columns in this chart. I don't think we have a basic disagreement but now let's move to the other side of this.

Gagné: Yes...

Merrill: And this whole question of cognitive strategy. Now let me just give a senator to this. Let me do this alright. The first one is that the reason we went to the content dimension in the first place facts concepts procedures rules is that is the thing I have mentioned earlier and that is it seemed to me that the definitions and examples of these things were sufficiently different that it created different conditions and therefore we needed a way to acknowledge that and just having intellectual skills didn't do it. Therefore, I wanted to break it up, you did it in a sense anyway because you have concepts and the rules and that since we broke it out. But I think the other thing is I think there's an equal break out the declarative level and this leads me to the more modern thinking. I was particularly intrigued by your daughter's book in a chapter in there she talked about organization elaboration as two things that help this in building our cognitive networks. And so I said now that's the case, then why not some structure. There must be then if the conditions assumptions right then there must be a particular organization that's appropriate for a particular kind of outcome and if that's the case then we ought to be able to organize knowledge in a particular way as the starting point of instruction and somehow whether it's a literal imparting or not I don't know I'm not trying to refer that but somehow we try to build a parallel cognitive structure in the student that somehow corresponds to this knowledge structure that we have in this content structure that we have outside. So the idea then was to take what we've recently

called facts and concepts which are kind of the component level and say okay we talk about organize sets a fact, talk about organize sets of concepts for these how things get organized and it seems to me that the way they get organized are let's get list for makers they are kind a boring. But if you get the taxonomies then it seems to me that one of the kinds of organization and you can impose on this network is to know I know that there's kinds of things anytime I learn the concept, I can always ask the question, what's the super ordinary concept, can you find a subordinate concept rather kind of these, in part of these, properties at these things, and obviously these are not either-or these are interlaced networks and that the reason for making this into a matrix instead of having just five kinds of categories is that coming back to the declarative level of things. I think that remembering kinds of network has some differences from remembering a path type algorithm. And that I can remember or I made using that term but I can remember those things quite independent of my ability to use them and it may be that there are learning outcomes or at least there are things that you to promote their remembering that I may want to avoid in fact what I really want is the use of those in a procedural away. So I'm arguing then that all of these twelve cells and they even get have more if you start looking at the various kinds of taxonomies, all of these cells meet the conditions in a rather than five categories, it really make sense to talk about twelve categories if we use content structure as a way for the other dimension. That's the argument.

Gagné: Well I really think you know that in your latest thinking that you've gone way beyond anything that I have tried to do, tried to think about, when you talk about the categories that fit into content structure, I think that's a very important idea.

Merrill: Good...

Gagné: It is new to you I guess, I am sure there have been people before who0 have said well now really there must be different organizations as I talked about organizations initially and surely they have some types to them too sure they have various different varieties. But nobody has ever differentiated them or described them that are what you are aiming to do here. Now I'm not sure that I agree with every one of the details.

Merrill: I am not sure I agree with the details, either. No problem there.

Gagné: Alright, I think this is very new, I think it's very original and I think is very good and I think it's good. Let me tell you how I think content structure.

Merrill: Okay...

Gagné: What I think content structure is. Well it is very different from what you have said. I think it's a scheme. You know the word scheme.

Merrill: Yes.

Gagné: Very popular these days. Nobody knows quite what it is.

Merrill: I think it's important to make it an aside for the audience too though and that is that we've talked a little bit about John Anderson's procedural knowledge and in one sense Anderson's theory is in fact he even use the term his cognitive SR theory in a sense and is not schema based. From a cognitive psychology point of view is schema which is an alternative way of looking at this. I think we need to make sure that.....that the schema and procedural knowledge this from the theoretical point of view you might have some differences but anyway.

Gagné: Well, but you see scheme is a larger think just as you have pointed out. There is not a single rule or a single principle even our so on. It isn't said a complex of associated ideas or concepts if you wish that are linked together and that you know that they also has other properties such as for example it has it has a it can have empty slots in it so that where you plug in other information and so on. So that if you talk about the standard example I suppose is the restaurant of our schema are going to a restaurant schema. You talk about all things that happened in the restaurant and you find that well you know somebody went to a restaurant and the you or he ordered some food and then he made a choice from the menu and then he ate something and so on and then all of a suddenly you say well now all of these must've been a wager. I didn't say anything about that, but everybody knows that you see. That's a part of this schema that we all carry around with this as a part of the restaurant schema are another part is paying the bill. See, no need to say anything about that its part of the restaurant schema. Now I think your content structures our schemes

Merrill: Very general schemes.

Gagné: Yes, right they are generally.

Merrill: Or classes of schemes.

Gagné: Well I don't know about that but I think the schemes and I think you are saying you are addressing is in so far you addressing this as a part of an instruction, you're asking the question, how do we establish a new schema. Now that's been written about by cognitive psychologist. Not very well but somewhat.

Merrill: And not very instructional.

Gagné: Yes right but I think that's what you're trying to say in terms of how do we establish a schema that deals with that is the kind of scheme that deals with the properties of something you see or with the properties and the functions altogether perhaps you see and how do we deal with a schema that is a kind of an algorithm. Or how do we deal with a schema that's a causal net. Alright, and you're trying to answer the question here, are you trying to pose of the question How one is there about on instruction that should be different when we are aiming to establish not just this kind of performance but this kind of a schema.

Merrill: Exactly!

Gagné: This kind of an internal organization called a schema which is you know God knows an abstraction, isn't it, but student may have mean goodness knows and but there we are, and I think that goes way beyond what I have talked about up to now although sometimes in my more recent papers I have played around with that notion of schema. But what I think you're trying to do is say How do we establish a schema, a new or perhaps how do we revise an old one. Now look, the other thing I thought is this. When you talk about these things here. It seems to me that one might say it would be useful you know there are a lot of concepts represented here by that thing there. Maybe some of them are not necessary to distinguish; maybe others are not there even. But, there are a lot of concepts there and it maybe then it really would be useful. And I'm not proposing to do it because I don't think we will, but I think it might be useful if we could decide what is a common, what is the thing we want to talk about here, each of these things. Let's decide on a name for it.

Merrill: That would be great.

Gagné: And then the question is how we do get everybody to use that name.

Merrill: All good that's a good goal, yeah help us and that is history of we made today.

Gagné: All I don't think we can do that today, this is hard stuff.

Merrill: Well, I know but we have started. These people see it starts in. Because we sort of attend, only agree to do some kind of riding after this, anyway.

Gagné: Well, I'm trying to make it clear why I'm so interested in your notion of content structure. I think that's marvelous because we will see how it clarifies that notion of declarative knowledge. You don't teach declarative knowledge because you want to say here's a set of facts. Suppose that a history teacher is teaching the ball, the cuts the writings of the Constitution, all right! I make her a good deal about that recently, snippets of facts here and there but what it is the history teachers teaching about, how the Constitution was formulated and made in the first place. How does that teacher want to know that that has been learned you see? That teacher does not really want to know can the students state certain facts that can be written down like this you know like this name five origins of the American revolutions or something and that is what the teacher wants to know. What the teacher does is say okay write an essay on this. That's not declare something or state something, it's really use something you see it comes back to use again, but what is being called upon for the student to do this, what the teacher is really judging terms of other than the spelling and punctuation or something you know what the teachers really judging there is does this student have an adequate a thorough going and also accurate schema of what that was all about. And that is really about what the teacher is calling upon is one of these content structures you talking about.

Merrill: And comparing what the student knows against that kind of idealized content structure.

Gagné: Yes, and notice that student doesn't have to say this in particular words, doesn’t have to say in a particular way, but there is something that represents what the teacher is trying to get out I would assume is trying to judge what is the nature of that schema that their student is supposed to have.

Merrill: And that's why the term remembers not be good but it still in that first column is on the declarative column.

Gagné: I'm talking about declarative knowledge.

Merrill: Exactly! Yeah, I would agree with that. There are a couple of other implications of this and then I'm going to ask refer for the discussion based on this afternoon.

Gagné: We have never taken a lot of time alright.

Merrill: Me as couple of other implications of this diagram I wanted to sure you see, because I'm not sure you agree. Let's look at the far right column and that is the column headed by cognitive strategy which also cuts across all of these. Now and in fact we look at all of the columns. The implication is and I wanted to retrieve your reaction. The implication is that not only are there different kinds of schemas if you will for declarative knowledge about this idea. We are also the second column suggests that there are different procedures applied to the schemes in terms of doing procedural kinds of things and those are different but also implies that the cognitive strategies or they may be general cognitive strategies might also be tied that the kind a scheme and that is or the kind of declarative knowledge. So if in fact I'm dealing with some kind of a cognitive strategy that deals with my manipulation of a taxonomy that the strategy might be different that how I deal with the causal met. So that's implied by this diagram.

Gagné: Well I certainly think that's a line of investigation to pursue here. I don't know that's true or not. Very few people have been brave enough to categorize cognitive strategies. One of them is new by the way that chapter called a final word a book by ..... is a very good chapter. It's extremely good and he's talking about of course general strategy of metacognitive strategies if you will but really can't raise you see. He said there different kinds and I think not many people and then well it seems to me now let's see. Somebody else did something Greno has a chapter called in which he tries categorizing the nature of problems. I don't know whether that all work or not, I really don't know whether that final column work out with these categories that you have over here at all, I'm not sure of that. But I certainly encourage you to pursue it.

Merrill: To look into the whole and see.....

Gagné: Certainly...

Merrill: Let me shift our conversation. I'd like to come back this afternoon after lunch and talk some more detail about some these cognitive psychology, maybe exhausted then.

Gagné: No, we are going to do that.

Merrill: But I thought that for kind of completeness this morning there some other areas that of comparison here we kind a concentrate on that top-line.

Gagné: Yeah we didn't get beyond the top line.

Merrill: The content dimension and objectives, hierarchies, but let me just for fun throw up different... Is that wrong!

Gagné: Ooo, are you talking about the events of instruction.

Merrill: I like to look at the events of instruction what I want to do is to try... I don't think there's a major disagreement here but... Look here! I listed here the events down the one side and some prescriptions from component display theory. Now right all of I guess I have to say it again in component display theory we really attempted to come up with an instructional theory here and there were not a prescription for how to design instruction incorporated as part of that. So, there really isn't a parallel you know set of events. And I like the events of instruction mostly I will tell you quarrels but not serious ones. But I've listed some things try to show that I think that in component display theory most of the things that are listed here attention or gaining students' attention is not something we've addressed so I indicated wasn't included as well.

Gagné: Much you can do but anyway.

Merrill: So I haven't said much about that. As far as objectives are concerned in our Reigeluth chapter, we have a table for specifying objectives in some detail and so it certainly address that the differences that I've never been very persuaded that presenting objectives to the student was a necessary activity except that I guess I use an anecdote here that I often use it in my students I said there's an experiment we can all do as a group that demonstrates completely you need to present objectives and I say

okay here's the experiment you have a passage of material and you are going to learn everything from that passage, okay if you studied that. Now here's the test; how many verbs were in that passage and you did not smile, how you passed the test. The point being that that's not when I say to you study the passage and learn all you can counting verbs is not probably something you would do right up as your English teacher but generally that's not an expected objective and so the reason that objectives don't work often in presenting the students is the students already have expected objectives that is expected anyway. Because of that I've never put much emphasize on but otherwise I think we don't have a quarrel.

Gagné: Well I think it I tend to bring into this a little bit of reason for motivation to. That is if a student knows what objective is and later is able to see that he's able to do that. This becomes a part of student motivation.

Merrill: Yeah, I agree with that.

Gagné: I say it in psychological terms, one establishes an expectancy which is then confirmed and that is what represents reinforcement. So well and it ties in with motivation so I think it's important and I think that on the whole these studies that have been done, tend to support this that it has some effect.

Merrill: As far as prior learning I like the events of instruction emphasizing prior learning, I agree with Bob, it's not emphasized in component display theory although as a secondary presentation from we have certainly indicated that presenting an example or a generality of the previous things is a necessary or desirable thing that is I don't think there's a quarrel there. I guess I have problems in the events of instruction against in interpretation problem and I've asked this question before. The distinction between what's the stimulus and what's the guidance gets muddy in some of the writings. I know even on that chart that we have passed out to everyone, one of the charts from which I compile that at present examples as part of the stimulus and the other ahead present examples as part of the guidance. Most of them indicate that is part of the stimulus, you have some attention focusing information I would have put that as part a guidance so to be those two categories get money which not a serious problem since they both have to be there anyway but I have no problem with that knowing where to put where.

Gagné: Basic things are you have to present the part of; you have to present that which is to be learned. That's the stimulus see and if in fact you know you're presenting you trying to teach somebody to respond to an in conversation of a French speaker then you have to present of sentences from the French speaker.

Merrill: Okay, I have no problem with that but let me give me another example which I do have problems with. Let me go back to my renaissance paintings. Let's say I'm teaching someone renaissance paintings. Now, is the stimulus I mean I could present it Let's call it as define concept alright. So I say a Renaissance painting is one that has a blue and gold border whatever. If you find by a rule in some way. And then we have the actual objects themselves of renaissance paintings but my goal is for the student to be able to classify previously encountered painting that is when he hasn't seen as a renaissance painting. Alright now what's the stimulus in that situation; is that the rule is that the paintings we are going to use as an instruction, it certainly isn't the painting I am going to use in performance because I want that be encountered if I presented at the presentation and is not an encounter. So now I don't know what the stimulus is.

Gagné: Well first of all I agree that you know there's a kind of a find line here sometimes between stimulus and kinds. I have think of this is being every time you present a painting that is in fact a stimulus, but at the same time you aren't following some other plan here with regard to guide, so you might be presenting the initial painting or you might be presenting a new instance of it. You see, both of them are the stimulus. Now let me say another thing no one more thing because I think that in the case in this example were using of the renaissance painting. Presenting the stimulus would be pretty much matter of what you call their EG. Yes and in fact and it would be presenting the painting in such a way that you had distinguished very carefully what these features were. You see if in fact every renaissance painting had a goal frame something then you would be emphasizing the goal frame. So you would be presenting this stimulus here and I mean in a general sense. I mean general; you would please be presenting the stimulus here in a general sense, in a way which emphasized its distinctive features.

Merrill: Okay, yeah and that part comes through clear, that's always clear. Let me see if I can reword this and see if I got the essence. It seems to me that if we talked about an event of instruction as presentation instead of the word stimulus I am going to get away from stimulus-response and if we use the term presentation and we say that a

presentation consisted of in my terminology generality and the instances is that consistent with your event of presenting the stimulus? That's why I put here the presenting generality instances with attention focusing help; those of the component display theory terms that I thought corresponded to what you meant then.

Gagné: Well, are you concerned then with distinguishing is from guidance or not?

Merrill: Yes, I am because I'll distinguish guidance here in a minute because I think we can distinguish it.

Gagné: Well then I don't proud of with what you have said.

Merrill: Okay, that for me is presenting the primary presentations with what we call attribute isolation or help.

Gagné: Alright fine.

Merrill: Now for guidance it seems to me there are a number of other things. Now, the boxes on this diagram where attempts to identify statements or rules, time is up. Component display theory which are either not emphasized or maybe not included in the conditions of learning explanation so some of these things are primary presentation form isolation, the attention focusing help you certainly emphasize the whole fading notion that I have talked about this morning the getting rid of the help and transferring the guidance to the students and students doing more of the process.

Gagné: Perfectly good idea, yes.

Merrill: That the virgins arrange a difficulty of variety of examples you have certainly... Matching I didn't see in conditions of learning specifically, certain you have talked about non-examples but not in matched care...

Gagné: Because I just don't go into that detail.

Merrill: That may be the answer. Alternative representation was the notion that if you have a verbal presentation, a graphic presentation may facilitate, mnemonics you have talked about context. Those all seem to me some of the guidance things that can be

done or certainly some of the prescriptions. I wouldn't guess that you have large quarrels with any of these.

Gagné: No I think, I simply think I would be inclined to use different words.

Merrill: Alright! I am open to that.

References

1. https://archive.org/details/ConvInstDesign retrieved on December 15, 2015.