

# A Conversation between Dana Zeidler and Geeta Verma & Lisa Martin-Hansen: Exploring Further Possibilities in Science Education

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This interview conversation among Dana Zeidler, Geeta Verma, and Lisa Martin-Hansen took place at the NARST conference on March 30, 2008. The purpose of this dialogue was to reflect on Dr. Zeidler's career in science education and his research on science teacher learning. During the conversation, Dana Zeidler shared his career path, establishing his research in science education, pushing the conversation on socioscientific issues (SSI) as well advice for researchers and doctoral students in the field. The written piece includes a brief summary of Dana's career achievements, a list of our conversation topics, the transcript of the audiotaped conversation, as well as a list of Dr. Zeidler's selected publications.

*Keywords:* Career, science education, socioscientific issues

## FOREWORD

Dana Zeidler is a professor of science education and the program coordinator for science education at the University of South Florida in Tampa, Florida. Dr. Zeidler received his Ph.D. in science education from Syracuse University, Syracuse, NY (1982); an M.S. in science education from Syracuse University, Syracuse, NY (1978); a B.S. in Education/Biology from State University of New York, College at Buffalo, NY (1976); and A.A.S. in Natural Sciences and Conservation, State University of New York, College at Alfred, N.Y.

Dr. Zeidler began his professional career in soil conservation. He made a shift in his career as he "preferred to work with people rather than test tubes, beakers, flasks and doing soil analyses." This led him to pursue teacher licensure in biology and general science

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**Figure 1. Professor Dana Zeidler**

at the high school level. He continued on to complete his master's degree in science education at the Syracuse University. He taught genetics, biology, evolution and science teaching methods as a graduate assistant during his enrollment in the master's degree program (and ultimately in the Ph.D. program). As he was immersed in the university climate, he began to understand that there is a broader field of science education and that interested him greatly. It was at this time that he decided to pursue his Ph.D. in science education. He began his

teaching career as a middle school physical and chemical Science teacher at Altmar-Parish-Williamson Central School, NY. After receiving his Ph.D. from Syracuse University, he began his university career as an assistant professor at Delaware State University where he gained tenure and associate professor rank. Later (1989) he moved to the University of Massachusetts as an associate professor and senior faculty directly the science and mathematics education doctoral program. After seven years, he accepted a position at his current institution, University of South Florida (USF) where he obtained full professorship. At USF, he has been the program coordinator for science education (Doctoral, Masters and Undergraduate Science Education).

Dr. Zeidler has delivered keynote addresses to several professional organizations including the International Conference of Trends and Issues in Science Curriculum Materials Research and Development, National Taiwan Normal University, Kung-Kuan Campus, Taipei, Taiwan; Linnaeus Tercentenary 2007 Symposium, Uppsala University, Uppsala Sweden; National Taichung University, Taichung Taiwan and National Chaiyi University Conference on Socioscientific Issues, Chaiyi, Taiwan. He has been a recipient of many awards including the recipient for the 2008 Association for Science Teacher Education Outstanding Mentor Award; recipient for the 2006 *Journal of Research in Science Teaching* best article award (Troy D. Sadler & Dana L. Zeidler); recipient of the President's Faculty Excellence Award (USF, 2003); Award for recognition of service to AETS (as Managing Editor of the *Journal of Science Teacher Education*); and recipient of 2002 and 1999 Outstanding Position Paper Award at the Southeastern Association for Science Teacher Education. Dr. Zeidler is renowned for his work in the science education community specifically focused on socioscientific issues (SSI). He has presented 50 papers at international and national conferences, and published 33 refereed journal articles. He has authored one book, edited one book, and published 8 book chapters and two monographs (see Appendix).

Dr. Zeidler has been an active member of several professional organizations in science education such as National Association for Research and Science Teaching (NARST), National Science Teachers Association (NSTA), American Educational Research (AERA), Association for Science Teacher Education (ASTE), and Southeastern Association for the Science Teacher Education (SASTE). He has served in many leadership positions throughout his career in these professional organizations. He was elected to the Executive Board of Directors for the National Association for Research in Science Teaching (2006-2009), was elected to the Board of Directors for ASTE (2008-2011) and was elected the President (2000-2001) of the Southeastern Association for Teachers in Science (SAETS). Additionally, he was

nominated to be the Conference Chair for the 2007 Annual Meeting of the Association for Science Teacher Education (ASTE), Clearwater Beach, Florida (2006) and to the Conference Coordination Committee (2006-2008) to the Association for Science Teacher Education (ASTE). In addition, he was elected and reelected as Managing Editor (1990-1994) for the *Journal of Science Teacher Education* (JSTE) published by the Association for the Education of Teachers in Science (AETS). He also has served on the editorial Board of Reviewers (1997-2002), for *Journal of Science Teacher Education* (JSTE) published by the Association for the Education of Teachers in Science (AETS), served on the Editorial Board of Reviewers for *Science Education* (1996-2005) and served multiple years on the Review Board for the *Journal of Research in Science Teaching*.

## INTRODUCTION

Our professional association with Dr. Zeidler at regional conferences such as SASTE has allowed us to establish a collegial and informal association. As researchers and scholars in the southeastern part of the United States, we have had the opportunity to hear Dana Zeidler speak on a number of occasions. Our own research areas of inquiry in fields such as nature of science and equity issues intersect in a number of ways with Dr. Zeidler research interests in socioscientific issues (SSI). At these regional meetings, we have encouraged our doctoral students to seek out scholars in the field, including Dr. Zeidler, and have informal conversations to facilitate their lines of inquiry.

Recently, we came across the article in *EURASIA Journal of Mathematics, Science & Technology Education* that featured a conversation with Dr. Sandra Abell and her professional career. This made us reflect upon the benefit of such narratives especially for junior scholars and doctoral students in science education. Our Ph.D. students have shared their respect and admiration for the scholarly body of work and the ideas generated by Dr. Zeidler. Thus we felt it will be beneficial to the science education community to showcase the professional career of Dr. Dana Zeidler. In this professional narrative, we interviewed Dr. Zeidler at the 2008 International Conference of National Association of Research in Science Teaching (NARST) in Baltimore, Maryland. In preparation for our interview, we reviewed Dr. Zeidler's vita and found another interesting aspect. In addition to his work in the science education arena, Dr. Zeidler has also established two martial arts schools in

West Townsend Massachusetts and Land O' Lakes, Florida in conjunction with Pasco County Parks and Recreation. He is a Sensei (Chief) Instructor of the Zeidler's Isshinryu Karate Club. He noted in his vita that these schools are "not run as a business but for a love of the art stressing the fusion of mind, body, and spirit." He has studied Isshinryu Karate since 1982 and has been promoted to Roku Dan (6<sup>th</sup> Degree Black Belt, 2004) and has trained with Grand Master Angi Uezu in Japan.

### Conversation Topics

We used the following conversation topics to guide the readers in our conversation with Dana:

- Dana Zeidler's journey leading him to his present position in science education
- Shaping of his professional career in science education
- Reflections on research perspectives linking nature of science and socioscientific issues
- Development of socioscientific issues as a line of inquiry in science education
- Advise for junior scholars and doctoral students in science education

In this section, we present a transcript of the audio-taped conversation and it is available on the journal's webpage. We use the following acronyms to represent the participants in this interview:

GV (Geeta Verma); DZ (Dana Zeidler); and LMH (Lisa Martin-Hansen)

GV: Tell us about your current position and what's your role and responsibility at your current institution?

DZ: Right now I am a professor at The University of South Florida. I am also the program coordinator for the science education and I have been there, now, for about 11 years, doesn't seem like that long but I am getting older and time is flying by.

GV: How did you begin your career in science education?

DZ: I began my career with a two-year degree in social and applied science and natural science's in agronomy and soil conservation. It's a two-year degree and [I] didn't quite know what I wanted to do after that except that I knew that I'd rather work with people rather than test tubes and beakers and flasks and doing soil analyses -- it was interesting to

find [out] what it was but I didn't really want to think about doing that for the rest of my life. I went on for a Bachelor's degree at a State University of New York, Buffalo and I went to State Teachers College, Buffalo State College (at that time), and I continued my work in biological sciences, minor in physical sciences and earth science, and began taking educational courses and did my internship -- my student teaching, up there.

In New York State to be permanently certified, you need to get a masters degree within 5 years, so I thought that I would go right on to Syracuse University to accomplish that and something unplanned happened in Syracuse -- I was able to talk my way into an assistantship from day one of my Masters degree (and which is [something] they [had] never done before, usually its [only] PhD students only they hire for an assistantship) but, somehow, I got the right person at the right time and talked my way into a teaching assistantship in Syracuse University and taught courses in genetics and evolution, methods courses, as well as being a Master's student.

I had [a] large tiered lecture hall and [it was] pretty intimidating being a page ahead of the students at that time but it was a good training experience. At that point, I had an office similar to the doctoral candidates. I began to understand that there is a broader field of science education out there. At that time, I had only [an] inkling that there was only a field out there, to be honest with you. And once you are immersed in that kind of university environment with other PhD students, you begin to learn real fast that there is a whole network of relationships that go on in our own field. And [I] just stayed right on going to a PhD degree for science education.

LMH: Who were some of the people that you worked with during that time?

DZ: My main mentor was a man named Larry Schaffer, who had a physics background and was the most creative teacher I have seen in terms of teaching methods. Even though he has done this [methods] course for years and years, he [would] sit down before the class and rethink how to present something in bit of a different way, and in a more nuanced way, and he was very creative so it was a good training working with him.

I worked with Ann Howe, who is a former president of NARST and Marvin Druger to some extent, he wasn't on my committee but obviously I

got to work with him and co-taught course with him -- a methods course. And at that time, probably my best friend and a fellow graduate student was Norm Lederman. He came in a few years after I started the program or maybe a year after I started or so, we went through graduate school together so I probably [have] known him longer than anybody else from NARST . . . and I still talk to him! [GV: that's a good sign.] He is an impressive figure and impressed me a lot... influenced a lot of my work, probably I'll talk about that later.

LMH: How about your dissertation? Where did you begin with your research?

DZ: Whenever I had an option to take an elective course even at the undergraduate level, I took a philosophy course or a psychology course, because I just had some affinity for it [as an] interest within me. And as I went on in graduate school, I began to see some underlying relationships between areas of developmental psychology and philosophy and things that I wanted to do with respect to getting kids engaged, reason, and learn to think. So I began taking a lot of courses in the Cultural Foundations Department which subsumed history, philosophy and sociology of education. And there is one gentlemen there who was the chair of the department by the name of Thomas F. Green, and now [is] the time to talk a little bit [about] him? ....I can do that ... [Interviewers: Sure.]

I respect a lot of people but I wouldn't say I put people up on pedestals...people are just people. I made an exception in his case because he struck me as the exemplary case of an eminent scholar. And the seminars I had with him! I took every course...four or five different courses with him. Some of the courses [were] from [other] people in the Cultural Foundations department. The kind of the things that we were reading paralleled my interests with topics in moral education and moral philosophy.

I became interested in Kohlberg's work at that time as well too. Thomas F. Green ended up in my committee... but in order to really learn some of the presuppositions and the details of moral developmental theory, I convinced my chair person, who was pretty open about it, to send me to Harvard University for a part of the summer to take a long workshop with Larry Kohlberg, whose work is probably known for theories of moral

development and [I] met some other post-doc students, [one] by the name of Marvin Berkowitz, one person who I'll [talk] about later. And their work obviously influenced me and got me really thinking about how people progress and reason and learn and make decisions based on social justice.

And I began to sort of apply that to science education, knowing that we have to do that kind of work with science education, as I said before, so I needed to find the bridge to science education and convince people [that] this [was] something of merit. At that time people would say "What does moral reasoning has to do with science education?" And my answer was "Fundamentally everything!" but I needed to convince people of that. So the foundation of my work began with looking at mediating factors of moral reasoning in science education

GV: And this was during your doctoral degree?

DZ: And that was in my doctoral degree.

GV: So did you doctoral dissertation specifically looked at some of [these ideas]?

DZ: That was the exact title.

GV: That was the exact title?

DZ: Right. I have a previous title but I changed it. I don't know if this all off the record or on the record. The first title was "Why Are There So Many A\*\*\*\*s in the World?" [Interviewers: ☺]. But that wasn't looked at [favorably] by the committee and so they asked me to modify that title to "Identifying Mediating Factors of Moral Reasoning in Science Education."

At that time, I looked at the capacity for people to reason both with formal reasoning ability and the differences between that and moral reasoning ability --- and there is a little gap or decalage between those two reasoning structures. And I tried to explain, in part, why that gap exists. And I would look at things like attitudes and comprehension of the area under consideration, people [making] judgments about that.

GV: So at that time I think STS was in full swing, right? [In the] 80's... around that time?

DZ: It was... coming up on the horizon because I began my Master's degree in 1976 and finished my doctoral degree by 1982, and STS was sort of coming on the horizon and would hit the same [time or] a little bit after that.

GV: Because one of your pieces talked about providing the theoretical framework for STS and

that's how you transitioned your work from STS to SSI?

DZ: Right, if I can clarify. . . if I may [*Interviewers: Sure.*]. The STS movement didn't really provide any kind [of] framework for my work. In fact, at that time, I swear that it seemed to be lacking some crucial elements that I felt were important based on the work that I had been doing, and that framework would eventually, 20 years later [or] so, would [be] known as socioscientific issues or SSI, but if you want me to jump ahead to explain [a] little bit about the differences [*Interviewers: go ahead.*].

I became interested in several aspects that I felt connected in some way to moral development and moral reasoning. I tried to find segues or portals in the science education [field] where it makes sense to look at that kind of work, and so I began doing some work in several areas. One included . . . some nature of science with Norm Lederman . . . another finger or branch was looking at argumentation and discourse and fallacious reasoning as well. Another work was that looking at developmental differences and moral judgment and cognitive abilities as well as . . . looking at also some sociological factors about the structures of society and how people think and reason in groups.

Eventually, I realized that the STS movement really didn't provide... in my opinion, a sound theoretical framework for its existence. To me, it seemed more like an ideology in search of a theory, than something [which] came from a theoretical base, and so I saw STS being a great advancement to begin thinking about connections among science and technology & society. Some individuals would begin to incorporate some elements of moral problems in that. But at best I saw, STS only alluding or kind of pointing out possible moral [kinds] of conflicts or problems or ethical considerations, but it didn't really compel people to seriously think and work in their way... to negotiate their way [through] these problems with respect to looking at character development, trying to see how people can progress through epistemological sophistication . . . different levels of epistemological reasoning.

I suppose that the lack of a strong theoretical framework or structure enabled me to begin combining those areas that I was looking at in a way that I thought was a better theoretical underpinning for developmental thinking and

consistent with what people do in character education for social justice. That's why eventually I was able to,... many years later, kind of synthesize that work together and kind of incorporate that into the SSI or socioscience education framework.

LMH: Now it sounds like this connection began quite early in your career.

DZ: It did. I remember writing a piece that was a paper that didn't get into a published form but I presented it at an STS conference, the only one that I went to in Crystal City, Washington D.C., and the title of the paper had something to do with "STS and the Missing link in Science Education" and to me that missing link was the things that many years later came to unfold but I probably could not articulate it well and it wasn't probably a very popular position to take.

LMH: I was going to ask you how [was] the general reaction at that time . . . how did it go.

DZ: Polite, you know nods and [then] "Next ..." [*Interviewers:☺*] "We have another presenter at this point..." And I, quite frankly, I don't think my thoughts were well-developed at that point... looking back at them... I have that paper on my table and look at it and say "Naah . . . not going to convince anybody yet."

GV: What advice would you have for Doctoral students in terms of developing their own line of inquiry especially, let's say, they're trying to get into socioscientific issues and moral reasoning and these kinds of topics?

DZ: You need to have a passion for what you are going to do because it's your dissertation and I see so many students, not my students of course, but many other students [*Interviewers:☺*] that will take what's easy and doable and will also tend to be the kind of dissertations that are "so what?" and "ho hum and nobody really cares!" And to my way of thinking . . . and for my personality, if you are going to immerse yourself for such a long period of time then you ought to really have some real vested interest in this topic to be personally motivated to really push the envelope. And so I would say, if you are going to choose a topic [choose] something that's personally relevant to you-- but also you need to convince other people that it is relevant to the greater science education community. That's the thing that I had to tackle with and grapple with when I was doing my dissertation.

GV: Was that difficult?

DZ: Syracuse University was great at providing [and finding] us leeway to pursue our own interests whether they are coming from philosophy or sociology or psychology . . . as long as you can convince them and connect it [with] science education. As I just said, that nobody had really ever done the area that I worked with then. They were probably little skeptical at first but they gave me leeway to make the case. And evidently I successfully made that case for them. So that's my advice – to pursue the things that really interest you as long as they are of interest to some part of the science education community. And be willing to take these kinds of risks to explore topics that you think are . . . need attention because there are a lot of things that we still don't know about.

GV: So what advice would you have for junior researchers trying to get published and are not as articulate . . . not well thought out because they are . . . early in the career but they are trying to do this kind of work which is not your traditional science education kind of scholarship?

DZ: Well like any sound research you need to do your homework. You need to see what's been out there. First, you need to engage in a reading program and look at the literature, look at the journals and look at other fields as outside of science education. [It has] to make sense with respect to connecting to your interests too. And so [if] I limited myself to the science education literature, I could never advance this research program. I [looked] outside to the character education and moral philosophy areas as well.

And so my advice is to see what is out there and then see where the assumptions are that need to be explored a little bit further. See where the openings are for new ideas. [Where] I think SSI research is right now is probably where NOS research was 20 years ago. And this is my opinion – I think it's beginning to really open up. We are just in the beginning stages of opening up by virtue [of] looking at the [research] program. [At] NARST, for example, looking at the articles and the journals and seeing how people are beginning to take this idea and look at different aspects of it. So, it's a ripe area but you need to kind of see what the framework is first and go from there.

[My] final suggestion is, don't limit yourself to the American journals, and look at the international journals. I was guilty of that too; I was very ethnocentric in my thinking and didn't realize until

later in my career (I mean on one level of course I did) but did realize these contributions that people from over the world have made [to] science education from the European countries; from Australia; from South America; from the Pacific Rim. Now that I have been traveling the world a bit more and beginning to look at those journals more recently, there are some really interesting works that can inform your work.

LMH: Now if we could travel back to time in Syracuse and then move on from there that was the beginning of your career in the academia. If you could continue on and tell us a little bit about where did you first began as an assistant professor and where was your research at that time and then just keep on going with us and lead us through your personal tour of where you have been with your research?

DZ: My first higher education position was at Delaware State University, Dover, Delaware. It was a small historically black college (HBC). I was attached to a program called the Learning Center and in that they took students who were "at risk" and [provide] them [with help in] their study skills and reading skills, and math and science skills. Of course, that's where I came in. And to develop a program that would try to position them better when they took their college level courses. [So] they wouldn't be blown out of their water and they can be more successful. And so retention was an important issue.

At that time, I really didn't think about having a research program proper. I just did what interested me and I don't know [if] that was wise or not. And maybe I was just a bit naïve to understand that "I need to have a research program." But I simply [did] the kind of research that interested me at that time and that's how I was looking at [it] . . . again some aspects of nature of science with Norm Lederman. And also looking at the differences between moral development and cognitive development. I didn't know exactly where [it] was leading but I thought there was [a lot of] work to be done and [it] interested me to do that kind of work.

So at Delaware I began teaching, I guess it's a kind of general science course or remedial science. I also began teaching for their masters program, only [an] occasional courses in science education, methods courses – sometimes a geology course too. And I also began at one point, [to] sort of

work my way into taking over the research design and methodology course and the developmental psychology course, required by the masters students.

From there, (I was there for 7 years), I went up to University of Massachusetts at Lowell. It was an opportunity to work at the Ph.D. level because Delaware, at that time, only had master's degree programs. And I continued working . . . teaching strictly graduate courses and again, I taught the research design methodology course. I began teaching a qualitative inquiry course as well and then my specialty courses within science education and continued working.

At that point of time, I began looking at argumentation and discourse, and fallacious reasoning as well, and eventually moved on to the University of South Florida where I have been for a longer period of time, where a lot of my ideas got pulled together, as I described to you before, and began as an associate professor there and worked my way up to professor.

GV: How do your view changes in the field of science over the time that you've been involved in science education? What do you see in terms of big emphasis discoveries in the coming years?

DZ: That's a tough one because if I say the wrong thing, you are gonna come back at me and say "by the way you are wrong about this" [Interviewers☺]. I feel sort of safe in speaking in my own territories. As I mentioned before, I think socioscientific issues research because it branches out to epistemology, reflective judgment, moral reasoning, character development, and argumentation and discourse. I think SSI has the potential to be a really fruitful research program. And whether your SSI is the central core what you are doing, you could be working [on] any of those areas [and] will be able to connect to it. And the areas that I mentioned, I think, also [are] ripe for development . . . epistemological reasoning and reflective judgment.

NOS research, to me at this point, in a lot of respects for a lot of individuals in our field, [seems] to be mopping up kind of operations as Thomas Kuhn would describe – and has fewer people sort of taking risks to push it in really new directions. And again, I think, being able to create situations in the classrooms that where kids were practicing . . . real decision-making, going through evidence and seeing how people can support various positions

based on [the] same evidence, has direct connections to nature of science research. So I think there is a kind of a new link that could be made with connecting nature science work with SSI and reflective judgment – that sort of thing. I hopefully have a paper coming out in JRST, if they like it well enough, that will tying a lot of those areas together – reflective judgment and nature of science within the context of socioscientific issues.

GV: In your own preparation, to do this kind of work, you said you took a lot of courses in cultural foundations and everything, so for us to prepare new Ph.D. student to go through this or work in this area then . . . that means we are kind of asking us to move them little bit outside of science education.

DZ: I think that's a good idea assuming that you have your strong philosophy department or cultural foundations or equivalent sort of department or psychology department, you know within a institution that sometimes might be limited at that persons institution, but to the extent that people can see that other disciplines that inform the work that you do and makes sense, I think that's a good thing.

After all, Ph.D. is a doctorate of philosophy and somehow we sort of leave off that later part out of our preparation . . . things that I was reading in a graduate school started with the fundamentals. Nichomachian Ethics – Aristotle, and Pluto's Republic and these were central to understand moral philosophy. I didn't fully understand it at that time but in hindsight I see it – working [my] way up through John Mills and other key philosophers. Eventually, I think those kind of your classic works provide a foundation where you can see links to present day ideas and provide a richer context for understanding the other theoretical work that you do. So . . . I am [often] moving people outside of certain boundaries and if sometimes [it] means taking a more than a minimum number of courses, what's wrong with that? Another semester or two in your total life – if it can really change your vision of the future.

GV: So what do you have your Ph.D. students do, the ones that you are the major advisor at your institution?

DZ: The same thing. There are certain courses in the science education that I am going to provide and offer. I have incorporated lot of things in my courses that I think they may not get in other

places. And so some of the other courses that I teach for the Ph.D. level would be . . . things like moral education & science education, a moral reasoning and moral development [course] and a course in cognition and epistemology of science. I am teaching another course in nature and philosophy of science and kind of general trends course, to kind of see what the current issues are.

So, I probably [in]corporate a lot of things that are missing in other places in my courses-- but having said that, we have a lot of flexibility in our program for them to take course work in other areas too. So [if] somebody wants to really have a strong background in instructional technology, which is not my forte, they have the flexibility to do that as well and then hopefully they kind of bring their interest in science education into that area as well. So I try to encourage that.

LMH: You have been invited a keynote speaker, a number of times. Can you tell us a little bit about what people invite you to speak about at conferences?

DZ: Lately I have had the honor of going to different universities. More specifically, some universities in Taiwan like National University of Taiwan and Uppsala University in Sweden – they are interested to hear about the research program mostly in socioscientific issues is . . . and they left it up to me to present what aspects I think are interesting or relevant to people who are kind of newer to this idea.

And with respect, for example, to Uppsala University conference in Sweden, they wanted to see how socioscientific issues fit in with scientific literacy. And so I was I was trying to and (I have written on this topic before) . . . you know, make the case that scientific literacy wouldn't be fulfilled or reached without attention to some of these things. It certainly [has] the other aspects of the scientific literacy, but making informed judgments that have implications for the environment and social justice, and those kind of moral considerations, certainly need to be [a] part of what we would think of as being an informed scientific literate individual. So I was asked to speak about those kinds of things.

LMH: What kinds of questions did you have following those conferences? What were people curious about?

DZ: I would be making it up if I could recall specific questions . . . I can tell you that there seems

to be lot of interest generated when I talk, whether it's the NARST conferences or the ASTE. The sessions were usually very well attended and afterwards, it's usually a number of newer faculty and sometimes older faculty and Ph.D. students that just want to know a little bit more about my thoughts on X, Y, Z – and they are becoming interested in doing research and some aspects on this – and I just have those kind of personal conversations with the people.

GV: What have been some of your greatest joys working in science education and struggles?

DZ: The best part of the job is working with other individuals which can also be a struggle [Interviewers:☺] as [you may] know too. I look at the students that I work with and they're all so bright and knowledgeable in areas I may not know about. And that always impresses me so I get better by my relationship with them. But working through the scholarship process, not just getting the dissertation – but the scholarship behind what it means to get a Ph.D., again that's meaningful in my mind, is the best part and when they begin to realize that I am [not] being obstinate or difficult for the sake of being obstinate or difficult that there is . . . you know . . . there's genuine issues at-hand that will elevate their positions in the long-run for what they want to do. I think in hindsight they kind of appreciate that, see the light and . . .

One of the best things that happened to me was a number of my graduate students, I have got about 20 + doctoral students of my own, they got together and wrote letters to ASTE, which is the Association for Science Teacher Education – to put me up for the Mentor of the Year Award and apparently they contacted other individuals from other institutions that were either new faculty or doctoral students that I helped one time or another. I don't know how they did this but they figured it out and so there was a really good array of letters that were written into the board on my behalf.

I didn't know this until they took me out at my birthday at a NARST conference in New Orleans last year, and we were eating together, about a dozen of us. I excused myself to leave the table for a few minutes. When I came back, no one was at the table! These students [were] playing a trick on me. On my plate was this folder and ribbons. Inside that folder contained all these wonderful letters that they had written – detailed letters – pages and pages . . . and then they came out from

their hiding places and congratulated me! And so they put me up for that award – I told them that even if I didn't win that, the letters meant more than anything else. But in the long run, I did receive the Mentor of the Year Award. So that was really a satisfying experience and it was a nice feeling to know that students felt that kind of reciprocity toward me – [and] that I do really feel for them, as much as of a hard time I give them.

LMH: You mentioned earlier Dr. Green. In your career, were there any other teachers or researchers who have influenced you through the years?

DZ: Oh, there are so many brilliant people in our field alone too . . . and [if] I should pick one of them, yet leave out certain names [they] would be insulted – but I can certainly talk about individuals like Glenn Aikenhead who has written a lot on scientific literacy – but he is going to be [one] the first people that I think took a real empathetic view of what means to be a scientifically literate and begin to make some connections to ethical concerns in science as well. Looking at Norm Lederman's works with Fouad Abd-El-Khalick and the work that he has done with Valerie Akerson and Randy Bell at that time.

Some of the individuals kind of crossed over and made some connections to socioscientific issues as well. But their whole research program on NOS and they're doing connections to some things that I am doing – and [it has] certainly been an influential asset to me. I look at some of the other people's work like Dianna Kuhn and Jonathan Osborne and some of the colleagues that he works with in Europe on argumentation [and] discourse have certainly informed my work as well.

Outside of science education beside Thomas F. Green and Larry Kohlberg, there have been other individuals in moral education and [the] character education field that have influenced my work too. Most notably, I can mention Marvin Berkowitz, who holds the only endowed chair position in the country in character education. He is at the University of Missouri, St. Louis and I have invited him to be a keynote speaker at ASTE and talk to science educators about character as well. And he is so prolific in his own field and we've talked quite [a bit] -- some of his work has been influencing me of late. And there are many others . . . we can go on for a long time.

GV: Talking about your publications, which work or works would you consider, in your opinion, to be influential or influencing the science education?

DZ: Which did you like the best? [Interviewers:☺]

LMH: I like one of your books that you had come out a little bit ago here. You edited a book with Springer. "The Role of Moral Reasoning on Socioscientific Issues and Discourse in Science Education".

DZ: Right. That was a piece that pulled a lot of things together. That was a book on the role of moral reasoning and socioscientific issues and discourse in science education. I wrote a number of chapters in there with other individuals as well and other people contributed to it that really had an interest in this area too. And that was a good opportunity to really pull together a lot of ideas. I am really happy with the book – seems to be pretty well received and I think that's also a good place for people to start if they want to know a little bit more about this area.

I have to say there are a lot of good papers that I have done with other individuals and I will be remiss if I didn't mention the name of Troy Sadler who is an Assistant Professor at the University of Florida. I think that Troy is also, while a new scholar, an exemplary scholar and his thinking has certainly influenced my thinking as well and hopefully some of me has rubbed off onto him too. The work that we have done together, I am very proud of – and I would say the one article that sort of got a lot of recognition in the field, I think, may be gotten me a few invitations to speak in other places – was the article where we did on our "Beyond STS" and then laying out the research agenda for socioscientific issues.

I knew that I was shaking some of the pillars, and you know, trying for the point of making a case . . . not tearing down one tradition but trying to show the real weaknesses of the STS tradition, and to show how that field could be moved in a different direction under the SSI framework. I tried to articulate in there, the rationale behind it and the reasons for it. Hopefully, I think we did a pretty good job and that seems to get a referenced quite a bit and got us a lot of recognition. So there [are] a lot of other papers that I am proud of but I won't tell you the specific ones . . . there are a lot of good ones. One of the papers is that I did with Troy Sadler, He was the first author of, in JRST was

“Patterns of Informal Reasoning in the Context of Socioscientific Decision Making” and that was voted for the outstanding article for JRST, 2005 – and of course, that was one that I am very proud of . . . to work with Troy on.

GV: So if we were to ask Dana to describe Dana, How would Dana describe himself? ☺

DZ: In terms of what part of my life?

GV: Your professional. If you want to throw in your personal, you are more than welcome.

DZ: That’s a hard one. I have tried to break down the barriers that naturally exist between professors and students. I think it’s an artificial divide but I know it’s partly institutional; it’s there too for a reason. But I have always tried to strip away that and begin a personal relationship with my students. That doesn’t mean that we have to be best friends but the point is we are both individuals. Even though I am on the one side of the fence and they are on the other, I never really saw that there has to be a fence there. And I guess I have been as successful as I have been with my students because I see them as smart people that can help me out. And they are creative in their thinking and [their] ideas -- and they’ll challenge me and push me in [new] directions. I think I am rather adept, now [at] challenging them and pushing them . . . it’s a two way street in our seminars and in our courses and I think that they have the freedom [and] flexibility to ask anything of me and challenge on any front or level. But again it’s a two way street and we both are better for it.

### **Concluding thoughts:**

We as interviewers recognize that we have only touched upon on Dr. Zeidler’s contributions to the field of science education. Hopefully, this article will enable members of the science education community to not only recognize his contributions and his interests outside of his scholarly work.

## Appendix: Selected Publications, Dana Zeidler, 1984-2008

- Abell, S. K., & Pizzini, E. L. (1992). The effect of a problem solving inservice program on the classroom behaviors and attitudes of middle school science teachers. *Journal of Research in Science Teaching*, 29(7), 649-667.
- Zeidler, D.L., Sadler, T.D., Callahan, B.C., & Applebaum, S. (In Press). Advancing Reflective Judgment through Socioscientific Issues. *Journal of Research in Science Teaching*.
- Zeidler, D.L. & Nichols, B.H. (In Press). Socioscientific issues: Theory and practice. *Journal of Elementary Science Teacher Education*.
- Dolan, T.J., Nichols, B.H., & Zeidler, D.L. (In Press). Using socioscientific issues in primary classrooms. *Journal of Elementary Science Teacher Education*.
- Zeidler, D.L. & Sadler, T.D. (2008). The role of moral reasoning in argumentation: Conscience, character and care. In S. Erduran & M. Pilar Jimenez-Alexandre (Eds.), *Argumentation in science education: Perspectives from classroom-based research* (pp. 201-216). The Netherlands: Springer Press.
- Zeidler, D.L. & Sadler, T.D. (2008). Social and ethical issues in science education: A prelude to action. *Science & Education*, 17(8, 9), 799-803. (Guest Editors for Science & Education Special Issue on: Socio-ethical Issues in Science Education.)
- Fowler, S.R., Zeidler, D.L., Sadler, T.D., (2008). Moral Sensitivity in the Context of Socioscientific Issues in High School Science Students. *International Journal of Science Education*. In Press.
- Walker, K. A. & Zeidler, D.L. (2007). Promoting discourse about socioscientific issues through scaffolded inquiry. *International Journal of Science Education*, 29(11), 1387-1410.
- Zeidler, D.L., Sadler, T.D., Simmons, M.L. & Howes, E.V. (2005). Beyond STS: A research-based framework for socioscientific issues education. *Science Education*, 89(3), 357-377.
- Sadler, T.D. & Zeidler, D.L. (2005). Patterns of informal reasoning in the context of socioscientific decision-making. *Journal of Research in Science Teaching*, 42(1), 112-138. (Awarded JRST Outstanding Article for 2005.)
- Sadler, T.D. & Zeidler, D.L. (2005). The significance of content knowledge for informal reasoning regarding socioscientific issues: Applying Genetics knowledge to genetic engineering issues. *Science Education*, 89(1), 71-93.
- Sadler, T.D. & Zeidler, D.L. (2004). The morality of socioscientific issues: Construal and resolution of genetic engineering dilemmas. *Science Education*, 88(1), 4-27.
- Sadler, T.D. & Zeidler, D.L. (2004). Negotiating gene therapy controversies: An activity to help students explicitly considers the ethics of genetic engineering. *American Biology Teacher*, 66, 428-433.
- Sadler, T.D. Chambers, F.W., & Zeidler, D.L. (2004). Student conceptualizations of the nature of science in response to a socioscientific issue. *International Journal of Science Education*, 26, 387-409.
- Zeidler, D.L. & Lewis, J. (2003). Unifying themes in moral reasoning on socioscientific issues and discourse. In D.L. Zeidler (Ed.), *The role of moral reasoning on socioscientific issues and discourse in science education* (pp. 289-306). The Netherlands: Kluwer Academic Press.
- Zeidler, D.L. & Keefer, M. (2003). The role of moral reasoning and the status of socioscientific issues in science education: Philosophical, psychological and pedagogical considerations. In D.L. Zeidler (Ed.), *The role of moral reasoning on socioscientific issues and discourse in science education* (pp. 7-38). The Netherlands: Kluwer Academic Press.
- Zeidler, D.L., Osborne, J., Erduran, S. Simon, S., & Monk, M. (2003). The role of argument and fallacies during discourse about socioscientific issues. In D.L. Zeidler (Ed.), *The role of moral reasoning on socioscientific issues and discourse in science education* (pp. 97-116). The Netherlands: Kluwer Academic Press.
- Sadler, T. & Zeidler, D.L. (2003). Scientific errors, atrocities, and blunders: Using bad science to promote moral reasoning. In D.L. Zeidler (Ed.), *The role of moral reasoning on socioscientific issues and discourse in science education* (pp. 261-285). The Netherlands: Kluwer Academic Press.
- Simmons, M. & Zeidler, D.L. (2003). Beliefs in the nature of science and responses to socioscientific issues. In D.L. Zeidler (Ed.), *The role of moral reasoning on socioscientific issues and discourse in science education*. The Netherlands: Kluwer Academic Press. (pp. 81-95)
- Sadler, T.D. & Zeidler, D.L. (2003). Teaching bad science: Highlighting the past to understand the present. *The Science Teacher*, 70(9), 36-40.
- Zeidler, D.L., Walker, K.A., Ackett, W.A., & Simmons, M.L. (2002). Tangled up in views: Beliefs in the nature of science and responses to socioscientific dilemmas. *Science Education*, 86(3), 343-367.
- Zeidler, D.L. (2002). Dancing with Maggots and Saints: Past and future visions for subject matter knowledge, pedagogical knowledge, and pedagogical content knowledge in reform and science teacher education. *Journal of Science Teacher Education*, 13(1), 27-42.
- Zeidler, D.L., Sadler, T.D., Berson, M. & Fogelman, A.L. (2002). Bad science and its social implications. *The Educational Forum*, 66, 134-146.
- Duplass, J.A. & Zeidler, D.L. (2002). Critical thinking and logical argument. *Middle Level Learning*, 15, (Sept.), M10-M13. National Council for the Social Studies.
- Torres, H.N. & Zeidler, D.L. (2002). The effects of English language proficiency and scientific reasoning skills on the acquisition of science content knowledge by Hispanic English language learners and native English language speaking students. *Electronic Journal of Science Education*, 6(3), March, Article 4. [<http://unr.edu/homepage/crowther/ejse/ejsev6n3.html>]
- Mueller, J. & Zeidler, D.L. (2002). A case study of teacher beliefs in contemporary science education goals and classroom practices. *Science Educator*, 11(1), 46-57.

- Zeidler, D.L. (2002). Rare and well done: Teaching in the other world. In D. Tippins, T. Koballa, & B. Payne, (Eds.), *Learning from cases: Unraveling the complexities of elementary science teaching*. Needham Heights, MA: Allyn & Bacon Publishing.
- Zeidler, D. L. (2001). Standard F: Participating in program development. In E. Siebert & W. Mcintosh (Eds.), *Pathways to the Science Standards: College Edition* (pp. 18-22). Arlington: VA National Science Teachers Association.
- Zeidler, D.L. & Duplass, J.A. (2000). Critical thinking and the role of logical argument in social studies education. *International Journal of Social Education*, 15(1), 113-127.
- Zeidler, D.L. (2000). Engineering ethics: Balancing cost, schedule, and risk -- lessons learned from the space shuttle. *Science Education*, 84(2), 278-280.
- Zeidler, D. L., LeBaron, J. F., Gupta, R. & Torres, H.N. (1999). Meeting the challenge of professional development: Design and evaluation of a telecommunications mediated STS course. *Journal of Science Teacher Education*, 10(3), 195-215.
- Zeidler, D. L. (1998). Visions: Teachers' perceptions of reform goals in science education. *Science Educator*, 7(1), 38-46.
- Zeidler, D. L. (1997). The central role of fallacious thinking in science education. *Science Education*, 81(4), 483-496.
- Zeidler, D. L. & Duffy, M. (1994). Are we almost there yet? Perceptions of goals and reform in science education. *Science Educator*, 3(1), 7-13.
- Lederman, N. G., Gess-Newsome, J., & Zeidler, D. L. (1993). A summary of research in science education--1991. *Science Education*, 76(4), 465-559.
- Lederman, N. G., Gess-Newsome, J., & Zeidler, D. L. (1993). *A summary of Research in Science Education 1991*. Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education. (Monograph 100 pages)
- Zeidler, D. L., Lederman, N. G. & Taylor, S. C. (1992). Fallacies and student discourse: Conceptualizing the role of critical thinking in science education. *Science Education*, 75(4), 437-450.
- Brinckerhoff, R. F. & Zeidler, D. L. (1992). *Values in school science: A teacher's handbook*. Reading, MA: Addison-Wesley Publishing Company.
- Zeidler, D. L. & Lederman, N. G. (1989). The effects of teachers' language on students' conceptions of the nature of science. *Journal of Research in Science Teaching*, 26(9), 771-783.
- McIntosh, W. J. & Zeidler, D. L. (1988). Teachers' conceptions of the contemporary goals of science education. *Journal of Research in Science Teaching*, 25(2), 93-102.
- Lederman, N. G. & Zeidler, D. L. (1987). Science teachers' conception of the nature of science: Do they really influence teaching behavior? *Science Education*, 71(5), 721-739.
- Zeidler, D. L. (1985). Hierarchical relationships among formal cognitive structures and their relationship to principled moral reasoning. *Journal of Research in Science Teaching*, 22(5), 461-471.
- Zeidler, D. L. (1985). Evaluating ethical decisions in the sciences. *Delaware State College Faculty Journal*, 12, 31-37.
- Zeidler, D. L. (1984). Moral issues and social policy in science education: Closing the literacy gap. *Science Education*, 68(4), 411-419.
- Zeidler, D. L. (1984). Comments on "Thirty studies involving the scientific attitude inventory: What confidence can we have in this instrument?" *Journal of Research in Science Teaching*, 21(3), 341-342.
- Zeidler, D. L. & Schafer, L. E. (1984). Identifying mediating factors of moral reasoning in science education. *Journal of Research in Science Teaching*, 21(1), 1-15.