

A tribute to Paul R. Pintrich's Contributions to Psychology and Education

Special issue in memoriam of Paul R. Pintrich

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Index

- A tribute to Paul R. Pintrich's contributions to Psychology and Education: Introduction by Margarita Limón	159-162
- Paul R. Pintrich and the research on epistemological beliefs, by Lucia Mason	163-170
- Paul R. Pintrich's contributions to conceptual change research by Gale M. Sinatra	171-174
- Conceptual change and the intentional learner outlined by Paul R. Pintrich, by Margarita Limón.....	175-184
-Meeting challenges in research on self-regulated learning: Contributions of Paul R. Pintrich, by Philip H. Winne	185-188
-About Paul Pintrich's work: motivational and cognitive processes self-regulation in educational settings, by Ignacio Montero & María José de Dios	189-196
-The human factor, by Patricia A. Alexander	197-202
-The international dimension of Paul R. Pintrich, by Erik De Corte	203-206
-A tribute to Paul R. Pintrich by Richard E. Mayer	207-210

**A tribute to Paul R. Pintrich's
Contributions to Psychology and
Education:
Introduction**

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Introduction

We dedicate this special issue to honoring the memory of our dear friend and colleague, Paul R. Pintrich. In this portion we present a brief commentary from well-known international specialists in the field; they address four topics which were focuses of Paul's research: epistemological beliefs and their role in learning and teaching, conceptual change, motivation in academic settings and self-regulated learning.

However, as can be seen from a quick glance at Paul's outstanding and brilliant academic trajectory (see the brief biography attached to this introduction), Paul's research was just one aspect of his influence in Psychology and Education. Add to this his wide-ranging work as editor, reviewer and member of the Editorial Board of almost all the most prestigious journals in the field, as President of APA Division 15 (Educational Psychology), President of Division 5 (Educational, Instructional and School Psychology) of the IAAP, outstanding member of EARLI, and, what he most liked, training and mentoring new specialists in the field--his students--and actively supporting collaboration and exchange among colleagues, both inside and outside his country.

Consequently, I have turned to three of the most outstanding colleagues in Psychology and Education, Patricia Alexander, Erik de Corte and Richard E. Mayer, that each might offer a general commentary on Paul's contributions to the field.

As editor of this part of the special issue, my goal is that readers who did not have the privilege of knowing Paul and his work may develop a clear idea of his lines of research, why they have been and continue to be so relevant to Psychology and Education, and about the broad avenues he left open to all of us to continue what he began. As Philip Winne says in his commentary on Paul's contributions, as his colleagues we will all have to strive mightly to match Paul's standards. I agree with Philip that this is a task we will take on in Paul's honor; I'm sure Paul would feel very happy that we are doing our best to advance the fields of Psychology and Education.

But also, and not less important, I would like these commentaries from some of his colleagues and friends to reveal to readers not only Paul's outstanding professional virtues, but also his values and exceptional qualities as a human being. In this regard, it seems indispen-

sable to highlight his deep honesty, simplicity and humility. Caring for his students, supporting them and doing his best to be a good teacher and mentor were some of the things he liked the most and strived for.

I am convinced he attained his goal (once more) and was an exemplary Professor and colleague. A goal that he no doubt had planned long ago. Paul was a lover of making plans. This is why those who knew him know it was no coincidence he was so interested in self-regulation and self-regulated learning, where planning goals plays a predominant role.

Considering his modesty, I think it likely that he would “grouse” me for writing all this about him, or even for editing this special issue and asking some of his friends and colleagues to write about him and his work. However, I am totally convinced that he very much deserves this tribute, and that it is the least his friends and colleagues can do to thank him for his work, his contributions at both a professional and personal level, and to note how much we will miss him in this field.

I want to thank all the participants in this portion of the special issue for their contributions. All of them have made excellent remarks about Paul and his work. I am very aware of how busy their agendas are; nonetheless, they have been extremely generous with their time in writing these pages. I am also aware that for some of them, very close to Paul, writing these pages has involved an additional effort that I want to doubly thank.

Finally, I want to especially thank Dr. Jesús de la Fuente Arias, Editor of the journal, and his collaborators, for their effort and interest in publishing this special issue to honor Paul’s memory. Some of them, as members of the Organising Committee of the *International Conference on Psychology and Education* organized by the Spanish National Association of Psychology and Psychopedagogy and the Department of Developmental and Educational Psychology of the University of Almería, had invited Paul to deliver the opening talk. I know Paul was very glad to receive this invitation, and I am quite sure he would have been very happy to contribute his support to their initiative promoting research in Psychology and Education. My wish is that this special issue may also make such a contribution.



Selection of some more recent publications by Paul R. Pintrich

Pintrich, P.R. (2003). A Motivational Science Perspective on the Role of Student Motivation in Learning and Teaching Contexts. *Journal of Educational Psychology*, 95(4), 667-686.

Sinatra, G.M., & Pintrich, P.R. (Eds.) (2003). *Intentional Conceptual Change*. Mahwah, NJ: Lawrence Erlbaum Associates.

Hofer, B.K., & Pintrich, P.R. (Eds.) (2002). *Personal Epistemology. The Psychology of Beliefs about Knowledge and Knowing*. Mahwah, NJ: Lawrence Erlbaum Associates.

Pintrich, P.R., & Schunk, D.H. (2002). *Motivation in Education* (Rev. ed.). Upper Saddle River, NJ: Merrill Prentice Hall. Trad. cast. *Motivación y Educación*, Madrid: Pearson/Merrill Prentice Hall, 2004.

Boekaerts, M., Pintrich, P.R., & Zeidner, M. (Eds.) (2000). *Handbook of Self-Regulation*. San Diego: Academic Press.

Paul R. Pintrich, Professor of Education and Psychology and Chair of the Combined Program in Education and Psychology at the University of Michigan, passed away suddenly at age 49 this past twelfth of July, due to a heart attack while touring on bicycle.

Professor Pintrich was an outstanding scholar in the field of Learning and Instruction. Particularly, his research focused on the development of motivation, conceptual change, epistemological thinking, self-regulated learning and higher education.

He was the editor of the *Educational Psychologist*, the American Psychology Association's journal for Division 15, Educational Psychology, from 1994 to 2000. Since 1991, he was co-Editor, with M. Maehr, of *Advances in Motivation and Achievement*, JAI Press (Greenwich, Connecticut). He was member of the advisory board of the *International Journal of Educational Research*, *Contemporary Educational Psychology*, *Learning and Individual Differences*, *American Educational Research Journal*, *Journal of Literacy Research*, *Journal of Educational Psychology* (until 1998), and *Developmental Psychology* (1992-1993). He was also ad-hoc reviewer for most of the principal journals in the field. Currently, he was editor of the *New Series on Education and Psychology*, from Lawrence Erlbaum Associates.

Pintrich was President of Division 15 (Educational Psychology) of the American Psychology Association in 2002. He was currently President of Division 5 (Educational, Instructional and School Psychology) for the International Association of Applied Psychology. He also served as Associate Dean for Research at the School of Education, University of Michigan, from September 1998 to September 2001.

Among his many honors and awards he liked to highlight the **Best Research Review Article Award** that he won along with his co-author Barbara K. Hofer in 1999, for an article on epistemological thinking that appeared in *Review of Educational Research*. Also the **Class of 1923 Award from the College of Literature, Science and Arts and the School of Education at the University of Michigan, for excellence in undergraduate teaching**, which he received in 1990. He was devoted to mentoring his students and he advised numerous PhD dissertations.

He was a member of EARLI since 1995 and had been collaborating with EARLI activities since 1994. Particularly, he very actively participated in activities of the SIG on Conceptual Change and on Motivation and Emotion.

He published more than 140 articles and chapters in the field and was co-author or co-editor of 9 books.

His family has established the **Paul Pintrich Education and Psychology Scholarship** to honor his memory and commitment to students. Contributions are kindly encouraged and may be sent to:

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Paul R. Pintrich and research on epistemological beliefs

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Abstract

This paper presents a brief commentary by Prof. Mason on the contributions of Paul R. Pintrich and his collaborators to the field of epistemological beliefs. In the course of her presentation, the author presents a review of epistemological beliefs: what they are, their role in learning and teaching and the main controversies discussed in this field.

Keywords: Epistemological beliefs / Learning / Teaching

In these few pages I wish to honor Paul Pintrich's memory by highlighting his excellent contribution, in collaboration with Barbara Hofer, to psychological research on epistemological beliefs. Together they authored the article "The development of epistemological theories: Beliefs about knowledge and knowing and their relation to learning", published in *Review of Educational Research* in 1997, and which received the Best Research Review Article Award from the American Educational Research Association. When I read this outstanding article, I was at the beginning of my exploration into this field of research, and I found it highly illuminating for its richness, completeness, rigor, and clarity.

What are epistemological beliefs? They are individuals' convictions about knowledge and knowing, that is, about the organization and sources of knowledge, their truth value, and justification criteria of assertions, forming a "personal epistemology" (Hofer & Pintrich, 1997, 2002). In the last decade, research on personal epistemology has flourished along two main lines: the development of epistemological thinking and the effects of beliefs about knowledge and knowing on different aspects of the learning process (Mason, 2002). Scholars agree on the developmental transition that leads toward a mature epistemological understanding (Moshman, 1998). In Kuhn's terms (1999, 2000; Kuhn, Cheney, & Weinstock, 2000; Kuhn & Weinstock, 2002), individuals shift from an *absolutist* to a *multiplist*, then to an *evaluativist* view of knowledge and knowing. According to the *absolutist* view, knowledge is absolute, certain, non-problematic, right or wrong, and does not need to be justified since it originates from observations of reality or authority. This belief characterizes, but is not confined to, epistemological thinking in childhood, and it can appear at later ages. From the *multiplist* position knowledge is conceived as ambiguous and idiosyncratic, since each individual has his or her own views and truths. This belief is typical of adolescence. An *evaluativist* view integrates and coordinates both the objective and subjective dimensions of knowing. An individual with an evaluativist view believes that two people may hold positions that are both "right", but one position can be "more right" than the other in that it is better supported. This more sophisticated perspective develops well into adulthood. It leads to a mature understanding of the nature and justification of knowledge that implies active processes of reflection and critical thinking.

It has been documented that personal epistemologies affect reading comprehension (Schommer, 1990), interpretation of controversial topics (Kardash & Scholes, 1996; Mason, 2000; Mason & Boscolo, 2003; Schommer, 1990), metacomprehension (Ryan, 1984; Schommer, Crouse, & Rhodes, 1992), ill-defined problem-solving (Schraw, Dunkle, & Ben-

dixen,1995), transfer of learning (Jacobson & Spiro, 1995), and conceptual change (Mason, 2003; Qian & Alvermann, 1995; Windschitl & Andre, 2003). In all these studies, less advanced epistemological beliefs, that is, that knowledge is absolute, simple, stable, and transmitted by authority, are associated with lower performance. Conversely, more sophisticated beliefs, that is, that knowledge is complex, uncertain, and derived from reason are associated with higher performance.

In their award-winning article, Paul Pintrich and Barbara Hofer critically and comprehensively review all research on the topic and clearly pose key questions for future investigation in the field. I mention them here briefly.

1. The need for clarification of the construct of epistemological beliefs, given that it varies in terms of what is included or excluded. In most of the educational psychology literature, epistemological beliefs refer to the nature of knowledge, the nature of learning, and often include beliefs about intelligence. On the other hand, in most developmental psychology literature, the term epistemological refers instead to knowledge, reasoning, and justification processes concerning knowledge only. Paul and Barbara propose that the content of the construct be limited to beliefs about the nature of knowledge and the process of knowing and they indicate the dimensions involved.

2. The need for studies that track the beginning of epistemological thinking, since few studies exist at lower than high school level. In this regard, the need for a link with research on theory of mind emerges prominently in this outstanding article. Both studies on theory of mind and on personal epistemology concern the development of a theory of knowing. Furthermore, research on the development of epistemological thinking after the college level, that is, outside educational programs, appears crucial to better examine the role of the sociocultural context.

3. The need for research on the motivational and contextual mechanisms that facilitate or constrain the change of personal epistemologies. In the classroom environment, for instance, teaching practices can convey an objectivist or constructivist way of knowing. Moreover, relationships between students' epistemological beliefs, motivational orientation, self-efficacy, and self-regulation have been pointed out as worth investigating to understand the affective components of personal epistemologies.

4. *The need for exploration into domain differences in epistemological thinking, given the inconclusive nature of research findings on this issue.* It could be said, as Paul and Barbara hypothesized, that both general and domain-specific beliefs are part of an interconnected network of assumptions about knowledge and knowing.

5. *The need for both quantitative and qualitative research methods based on the use of more structured as well as open-ended instruments, since large-scale quantitative assessment should be integrated with phenomenological inquiries.* In the former, students react to forced-choice items, whereas in the latter they generate their own thinking. Only the combination of these approaches can allow an in-depth understanding of the nature and development of beliefs about knowledge and knowing.

I believe that Paul Pintrich, together with Barbara Hofer, made an excellent contribution to constructing and advancing the research on personal epistemology. Scholars in the field have benefited to a large extent from their seminal work.

Allow me to conclude this discussion with some personal remarks. I clearly remember when I met Paul for the first time. It was at the Leipzig airport in Germany, in September 1994. Both of us were waiting for a flight to Jena to participate in the first EARLI SIG “Conceptual Change” symposium. At that time I had already read another outstanding and seminal contribution by Paul Pintrich, together with Marx and Boyle, that is, the article “Beyond cold conceptual change: The role of motivational beliefs and classroom contextual factors in the process of conceptual change”. I was glad to have a chance to talk with him in an informal setting. We had a lively, although short, conversation about cultural differences between Europe and the United States. Since then, we met at other conferences, either in Europe or the U.S., and our collaboration became closer. As organizers of the 10th EARLI conference held in Padua in 2003, Pietro Boscolo and I invited Paul Pintrich to give a keynote address. He accepted with enthusiasm the invitation to present his research findings at an old, famous university in the foreign country he most loved for its artistic, historic, and natural beauties. His name took the first place in our list of invited speakers. We would have been very honored to have him in Padua. We continued to be in contact with him until the day before his sudden death.

I am very grateful to Paul for inviting me to contribute with a chapter to an important book he edited with Gale Sinatra, entitled *Intentional conceptual change*, published by Lawrence Erlbaum Associates at the beginning of 2003. He always encouraged me to go ahead with my research ideas. I learned a great deal from him – and not only from the professional point of view. I thank Paul for being so inspiring and warmly supportive.

References

- Andre, T., & Windschitl, M. (2003). Interest, Epistemological belief, and intentional conceptual change. In G.M. Sinatra & P.R. Pintrich (Eds.), *Intentional conceptual change* (pp. 173-197). Mahwah, NJ: Lawrence Erlbaum Associates.
- Hofer, B.K., & Pintrich, P.R. (1997). The development of epistemological theories: Beliefs about knowledge and knowing and their relation to learning. *Review of Educational Research, 67*, 88-140.
- Hofer, B.K., & Pintrich, P.R. (Eds.) (2002). *Personal epistemology. The psychology of beliefs about knowledge and knowing*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Jacobson, M.J., & Spiro, R.J. (1995). Hypertext learning environments, cognitive flexibility, and the transfer of complex knowledge: An empirical investigation. *Journal of Educational Computing Research, 12*, 301-333.
- Kardash, C.M., & Scholes, R.J. (1996). Effects of preexisting beliefs, epistemological beliefs, and need for cognition on interpretation of controversial issues. *Journal of Educational Psychology, 88*, 260-271.
- Kuhn, D. (1999). A developmental model of critical thinking. *Educational Researcher, 28*, 16-26.
- Kuhn, D (2000). Theory of mind, metacognition, and reasoning: A life-span perspective. In P. Mitchell & K.J. Riggs (Eds.), *Children's reasoning and the mind* (pp. 301-326). Hove, UK: Psychology Press.
- Kuhn, D., Cheney, R., & Weinstock, M. (2000). The development of epistemological understanding. *Cognitive Development, 15*, 309-328.
- Kuhn, D., & Weinstock, M. (2002). What is epistemological thinking and why does it matter? In B.K. Hofer & P.R. Pintrich (Eds.), *Personal epistemology. The psychology of beliefs about knowledge and knowing* (pp. 121-144). Mahwah, NJ: Lawrence Erlbaum Associates.

- Mason, L. (2000). Role of anomalous data and epistemological beliefs in middle students' theory change on two controversial topics. *European Journal of Psychology of Education, 15*, 329-346.
- Mason, L. (2002). Developing epistemological thinking to foster conceptual changes in different domains. In M. Limón & L. Mason (Eds.), *Conceptual change reconsidered. Issues in theory and practice* (pp. 301-336). Dordrecht, NL: Kluwer Academic Publishers.
- Mason, L. (2003). Personal epistemologies and intentional conceptual change. In G.M. Sinatra & P.R. Pintrich (Eds.), *Intentional conceptual change* (pp. 199-236). Mahwah, NJ: Lawrence Erlbaum Associates.
- Mason, L. & Boscolo, P. (2003). *Role of Epistemological understanding and interest in interpreting a controversy and in topic-specific belief change*. Submitted for publication.
- Moshman, D. (1998). Cognitive development beyond childhood: Constraints on cognitive development and learning. In W. Damon (Series Ed.), D. Kuhn & R. Siegler (Vol. Eds.), *Handbook of child psychology: Vol. 2: Cognition, language, and perception* (5th ed., pp. 947-978). New York: Wiley.
- Qian, G. & Alvermann, D. (1995). Role of epistemological beliefs and learned helplessness in secondary school students' learning of science concepts from text. *Journal of Educational Psychology, 87*, 282-292.
- Schommer, M. (1990). Effects of beliefs about the nature of knowledge on comprehension. *Journal of Educational Psychology, 82*, 498-504.
- Schommer, M., Crouse, A. & Rhodes, N. (1992). Epistemological beliefs and mathematical text comprehension: Believing it is simple does not make it so. *Journal of Educational Psychology, 84*, 435-443.
- Schraw, G., Dunkle, M.E., & Bendixen, L.D. (1995). Cognitive processes in well-defined and ill-defined problem solving. *Applied Cognitive Psychology, 9*, 523-538.

Lucia Mason is an Associate Professor of Developmental and Educational Psychology at the University of Padova, Italy. Her main research interest at the present pertains to personal epistemology and its relationships with learning, in particular with conceptual change processes. She has been coordinator of the EARLI SIG on Conceptual Change from 1997 to 2001. She is co-editor of two volumes published by Kluwer Academic Publishers, Dordrecht, The Netherlands: P. Tynjala, L. Mason, & K. Lonka (2001), *Writing as a Learning Tool. Integrating Theory and Practice*, and M. Limón & L. Mason (2002), *Reconsidering Conceptual Change. Issues in The-*

ory and Practice. She is also author of the book *Verità e Certezze. Natura e Sviluppo delle Epistemologie Ingenuae*, published in 2001 by Carocci, Rome, Italy. She is author and co-author of several articles in national and international journals, and essays in international volumes about Conceptual Change and Epistemological Beliefs.

Paul and she participated and organized numerous sessions on Conceptual Change and Epistemological beliefs in AERA and EARLI Conferences and SIGs meetings since 1994. She also collaborated with Paul on two recent books on Conceptual Change: Limón, M. & Mason, L. (Eds.) (2002), *Reconsidering Conceptual Change: Issues in Theory and Practice*. Dordrecht, The Netherlands: Kluwer Academic Press, and Sinatra, G. M. & Pintrich, P.R. (Eds.) (2003). *Intentional Conceptual Change*. Mahwah, NJ: Lawrence Erlbaum Associates.

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Paul R. Pintrich's Contributions to Conceptual Change Research

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Abstract

The author presents her view about Paul R. Pintrich's contributions to conceptual change research and the changes he inspired in recent research in this area. Particularly, Sinatra emphasizes how Paul Pintrich's thinking and research have provoked a turn towards "warmer" models of conceptual change that take into account motivational beliefs, goals, metacognition and social factors.

Keywords: Conceptual Change / Intentional learning

Conceptual change was by no means Paul Pintrich's main area of research. And yet, his 1993 article, *Beyond cold conceptual change: The role of motivational beliefs and classroom contextual factors in the process of conceptual change*, co-authored with Ron Marx and Robert Boyle, arguably changed the field as much as any single contribution to conceptual change research. Prior to the "hot cognition" article, accounts of conceptual change from theorists and education researchers mainly focused on three areas: 1) the influence of cognitive factors such as students' existing knowledge or preconceptions or misconceptions on change, 2) developmental changes in young learners' knowledge representations, and 3) the design of instructional methods to foster change. With few exceptions, these accounts gave little recognition to the affective, situational, and motivational factors that influence, and sometimes determine, whether or not change occurs.

The hot cognition article led to new models of conceptual change that emphasized motivation as a determining factor of change. The Cognitive Reconstruction of Knowledge Model (CRKM) (Dole & Sinatra, 1998) and the Cognitive-Affective Model of Conceptual Change (CAMCC) (Gregoire, 2003) are two examples of the "warming" trend in conceptual change models in the direction Paul inspired. Both models feature strong affective components, components that include motivation, efficacy beliefs, affect, and intentions. Paul put forth his own vision for the role of motivation in conceptual change more specifically in a recent chapter in Schnotz, Vosniadou, and Carretero's volume, *New Perspectives on Conceptual Change* (Pintrich, 1999).

Paul's influence on my thinking is one reason I approached him to co-author a book I was planning on intentional conceptual change. I had just returned from a sabbatical at University of Toronto/Ontario Institute for Studies in Education (OISE) and was excited about the OISE researchers' perspectives on intentional learning. Ralph Reynolds, my department chair, collaborator, and friend, suggested I ask Paul to co-edit the volume.

I remember thinking that Paul must have gotten requests of this sort so frequently that it was hardly worth pursuing. But, taking Ralph's advice, I approached Paul at AERA a couple of months later and gave him a very brief description of the idea for the volume and asked him if he would be willing to be involved. To my surprise, a few weeks after AERA, he replied that he would indeed be interested in co-editing the volume. I was thrilled, but I had no idea what a wonderful experience I was about to have.

I expected that such a busy and productive scholar would take a backseat role. I had hoped that he would help me secure a few contributors, and occasionally give me some feedback on chapters. To my delight, he took a full co-editorial role. Paul was an intellectual guiding force on the project and together we collaborated on our vision for a definition of the construct “intentional conceptual change.” Our final definition of intentional conceptual change as the “goal-directed and conscious initiation and regulation of cognitive, metacognitive, and motivational process to bring about a change in knowledge” shows his mark (Sinatra & Pintrich, 2003, p. 6). Specifically, and not surprisingly, he added “goal-directed” as a defining characteristic of intentional conceptual change.

Like many of the other areas of his research, Paul left an indelible mark on the field of conceptual change. It is unlikely that motivation will ever be ignored in future conceptual change models. It is equally unlikely that conceptual change researchers will ever forget Paul Pintrich’s profound influence on our thinking. Paul made all of us think differently. What a wonderful legacy for a conceptual change researcher.

References

- Dole, J.A., & Sinatra, G.M. (1998). Reconceptualizing change in the cognitive construction of knowledge. *Educational Psychologist, 33*, 109-128.
- Gregoire, M. (2003). Is it a challenge or a threat? A dual-process model of teachers' cognition and appraisal processes during conceptual change. *Educational Psychology Review, 15*, 147-179.
- Pintrich, P.R. (1999). Motivational beliefs as resources for and constraints on conceptual change. In W. Schnotz, S. Vosniadou, & M. Carretero (Eds.), *New perspectives on conceptual change* (pp. 33-50). Oxford, UK: Elsevier Science.
- Pintrich, P.R., Marx, R.W., & Boyle, R.A. (1993). Beyond cold conceptual change: The role of motivational beliefs and classroom contextual factors in the process of conceptual change, *Review of Educational Research, 63*(2), 167-199.
- Sinatra, G.M. & Pintrich, P.R. (2003). The role of intentions in conceptual change learning. In G.M. Sinatra & P.R. Pintrich (Eds.) *Intentional Conceptual Change* (pp.429-441). Mahwah, NJ: Erlbaum.

Gale M. Sinatra, Ph.D. is an Associate Professor of Educational Psychology at the University of Nevada, Las Vegas, U.S.A. Her research interests include conceptual change learning and intentionality as well as reading acquisition, comprehension, and assessment. Her recent book, co-edited with Paul R. Pintrich, *Intentional Conceptual Change*, was published in 2003 by Lawrence Erlbaum Associates, U.S.A.

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Conceptual Change and the Intentional Learner as outlined by Paul R. Pintrich

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Abstract

This brief paper presents text read by the author as representative of the Conceptual Change SIG at the EARLI Conference (Padova, 26-30 August, 2003), during a memorial session held in honor of Paul R. Pintrich. It seeks to summarize some of Pintrich's main contributions to the field of Psychology and Education and particularly, to research on Conceptual Change.

Keywords: Conceptual Change/ Intentional learning/ Epistemological beliefs/ Self-regulation/ Motivation/ Cognitive Psychology/ Education

Introduction

During the most recent EARLI Conference, held in Padova (August 26-30, 2003), Paul was invited to deliver a keynote address. To substitute his talk, Monique Boekaerts (University of Leiden, The Netherlands), Chair of that session, coordinated a memorial session to honor Paul's memory. As past coordinator of the Conceptual Change SIG, in which Paul was very involved, and representing our group of Conceptual Change, I read the following text that I had prepared regarding his contributions both to the research on Conceptual Change and to the field of Psychology and Education.

I think this general commentary fits well with the purpose of this portion of the special issue; therefore, I have decided to keep the original text with minor changes. I have only added a title, edited the text, included the references and added a final personal remark.

Conceptual Change and the Intentional Learner as outlined by Paul R. Pintrich

“As representative of the EARLI SIG on Conceptual Change in which Paul was involved, my role in this session will be to present a brief overview of his major contributions to conceptual change and to the development of epistemological thinking. However, I would also like to stress some more general contributions he gave to the field of learning and instruction. Let me begin with these more general contributions to go later to the more specific ones.

I think a full understanding of a scientist's contributions cannot be accomplished without understanding the person that is behind, his mind, his personality, his own goals in life and his values.

In this regard, **firstly**, it is important to note that one of Paul's biggest passions -together with waves and body surfing, and riding bikes-, was teaching and mentoring his students. Considering this passion, it is not strange at all he was concerned on knowing more about how to improve students' learning and motivation. In this sense, I would like to stress his devotion to his students and how much he liked taking care of them as a major general contribution he gave to us.

I think it can be stated without hesitation that he was a model to be followed. He was absolutely engaged in his research, but what he most wanted was to be a good professor. He always said the award he was most proud of was the one his undergraduate students gave to him for his teaching. And he often applied his research results and his theoretical views about motivation, learning and teaching to his own practice.

Secondly, Paul loved *to make plans, I'd even dare to say he was "a fanatic of planning", goal setting and goal achievement*, although as a good self-regulator he was flexible enough to change his plans when necessary. For Paul, everything had to be planned in advance (frequently, a long time in advance) and he needed to know about the details of what was going to be done. Once you knew him more at the personal level, it was clear why he was so interested in self-regulated learning and the important role planning has in it. Also, it was clear to me all his research was perfectly planned to fit in a coherent schema he had, he was developing carefully along his career.

To show you to what extent planning was present in his research, let me tell you a brief anecdote. Just about three months ago, he told me, given that he was going to turn 50 this year, he needed to plan his research and books for the next 10 years!!! And he also had already planned when he would be retired and what he would be doing at that time.

Self-regulation was very present in his own life and research. As a good planner and self-regulator *he loved systematization, order and clarity*. I think these characteristics are very present in many of his publications. He was a master of writing excellent theoretical reviews in which he managed to fit together very different theoretical perspectives, to highlight key questions that needed further research and to open up new issues for moving ahead. I could quote many of his papers as an example of this, but perhaps the most paradigmatic example of this contribution was the paper that appeared in *Review of Educational Research* in 1997, co-authored with Barbara Hofer, on epistemological thinking (Hofer & Pintrich, 1997). This paper received the Best Research Review Article Award from the American Educational Research Association.

I think both research on conceptual change and epistemological thinking, as well as the self-regulation and motivation fields, have highly benefited from these *excellent examples of how*

a good theoretical review paper must be. And from my view, this was another general contribution he made. (For a very recent example in the field of motivation, see Pintrich, 2003).

Thirdly, and closely related to his personal epistemology and to his understanding of Psychology as a discipline, Paul considered himself a scientist. As a psychologist interested in knowing more about cognitive and motivational processes and also, but not only, in the implications these processes may have for Education.

In his closing paper as editor of *Educational Psychologist* (Pintrich, 2000a), he pointed out a tension in the field between the basic and the applied research dimensions. This tension is also linked to one regarding the use of qualitative vs. quantitative methodological approaches and to the controversy between the need of to conduct research in real-life settings, or in more experimentally controlled situations. He claimed these tensions often lead to some fragmentation in the field and raise questions regarding our identity as a discipline.

Paul proposed that much of educational psychological research should be guided both by goals of scientific understanding as well as by usefulness. He believed that not all of our research should have an applied goal of utility, and he proposed (I quote him literally):

“educational psychologists could join other cognitive, developmental, social and personality psychologists in trying to develop theories and models that are tested in scientific ways to increase our fundamental understanding of learning, development, cognition and motivation. This can be basic experimental research that adds value by increasing our scientific understanding, even if there are a few readily envisioned applications currently.

At the same time, however, we also should be involved in research that has both scientific and utility goals of understanding the individual in context and developing useful applications for education”. (Pintrich, 2000a; p. 224)

This concern about the need for further clarification of and agreement on the goals and methodology of our discipline as a science, and his call for both basic and applied research developed in both real-life settings and under more controlled experimental conditions was another of his general contributions to the field.

Fourthly, I would like to highlight some of Paul's values and his beliefs about how scientists should work. *He really believed in collaborative learning and tried to put it in practice.* He was always willing to facilitate contacts and links among our scientific community on both sides of the Atlantic. And I think the SIG of Conceptual Change and some other members of EARLI have benefited widely by it. In the past years, we have organized several coordinated sessions about conceptual change and epistemological thinking both in AERA and EARLI conferences, and I think both these sessions and the SIG seminars we had have contributed widely to strengthening links among the specialists of our field. This fact has facilitated and promoted common publications. Even if he was a top name in the field, he was a very humble and accessible person very willing to support and help other colleagues. I remember him frequently with a long queue of people waiting to talk with him after sessions and he was always listening to everybody patiently and attentively, always with a ready smile.

I will refer now to the **more specific contributions** Paul made to the fields of conceptual change and epistemological thinking. Basically, I think he was *a pioneer in trying to put together motivational and cognitive processes.*

How did he connect motivational beliefs and self-regulated learning to **conceptual change**? The first answer to this exciting question that I think Paul was refining and completing later in following papers, chapters and recent books (e.g. Sinatra & Pintrich, 2003), may be found in his 1993 paper together with Ron Marx and Robert Boyle in the *Review of Educational Research* under the title: "Beyond Cold Conceptual Change: the role of Motivational Beliefs and Classroom Contextual Factors in the Process of Conceptual Change".

I think this paper was a breakthrough in the field of conceptual change. Paul always said he became involved in EARLI because of this paper, that otherwise he would not had been invited to our SIG meetings. In fact, it was so. Just a few months after this paper was published he was invited to participate in the first meeting of the EARLI Conceptual Change SIG celebrated in Jena in August, 1994, organized by Wolfgang Schnotz and Stella Vosniadou. That was a very successful meeting and he decided to get involved in EARLI and become a member of our association and, as he said, he never missed a single EARLI Conference since then!! He considered the EARLI Conference a very good meeting and he contributed very much with his strong support in attracting other USA colleagues to participate in our conferences, for which we must thank him very much.

But besides this anecdote about how this paper was really important for the EARLI Conceptual Change SIG and for Paul's involvement in EARLI, I want to explain more carefully the links and connections he began to make among some of the pieces of the “learning and instruction” puzzle: motivational beliefs, self-regulation, prior knowledge, classroom context, and later, personal epistemology.

The basic criticism he and his colleagues made to conceptual change models developed so far was that they may not adequately describe learning in the classroom context. Motivational beliefs and goals seemed to play a role that may contribute to whether learners activate adequate prior conceptual knowledge.

Motivational constructs such as goal orientation, value, efficacy and control beliefs **can serve as mediators in the process of conceptual change and influence cognitive factors** such as selective attention, activation of prior knowledge, use of deeper or more surface processing, problem finding and solving, metacognitive evaluation and volitional control and regulation.

They also stressed that learners do have intentions, goals, purposes and beliefs that drive and sustain their thinking. And that these motivational beliefs can influence the direction of thinking when learners attempt to adapt to the classroom demands and constraints.

Prior knowledge forms a framework for judging the validity of the new information to be learnt. But this prior knowledge may be also influenced by what Hofer & Pintrich (2002) have called “**personal epistemology**”. They considered *personal epistemology* to involve the individual's cognitions about knowledge and the nature of knowing (Pintrich, 2002, p.390). That is, it includes cognitions and beliefs about the certainty of knowledge, simplicity of knowledge, source of knowledge or justifications for knowing.

Epistemological beliefs may also be related to some motivational aspects. Hofer & Pintrich (1997) suggested that epistemological beliefs may work as implicit theories that can give rise to certain types of goals for learning. These goals may function as a guide for self-regulatory cognition and behavior. Therefore, personal epistemology became another piece of the puzzle that needs to be fitted in.

From my view, ***Paul contributed to draw a more complex view of the learner*** in which individuals' motivational and cognitive processes are clearly interacting between themselves, and also with the context where the learning process is taking place.

To give a more accurate idea of this learner, I will use a metaphor I developed when preparing my tenure exam a few years ago and that I discussed with Paul a few times (Limón, 2001). I propose four *metaphorical* constructivist learners that illustrate, from my view, progress made in our field since the seventies. These four metaphorical learners are: the logical learner, the specialist learner, the situated learner and the intentional learner.

The ***logical learner*** can be described as a Piagetian learner. He learns through the assimilation and accommodation mechanisms described by Piaget. The main goal the logical learner should achieve is to build appropriate cognitive structures that will continue developing with age. Cognitive change would be achieved as a consequence of a rebalance process initiated by cognitive conflict.

The ***specialist learner*** can be described as the one that results from acquiring expertise in a particular domain. The goal of this learner is to become expert in a domain. Learning would be considered a rather domain-specific process and thus, domain-specific models should be developed to account for learning in different domains. Conceptual change would involve restructuring of domain-specific knowledge, involving not only quantitative, but also qualitative changes.

The ***situated learner*** can be described mainly as a social learner that belongs to different communities of practice. It would be the product of the socioconstructivist view of learning. He learns in context and learn with others and from others. The situated learner builds situated knowledge. Conceptual change would not involve replacing or restructuring prior knowledge with the “correct” scientific or disciplinary knowledge, but identifying new contexts where that knowledge may be applied and to learn the different meanings it may have.

Finally, the ***intentional learner*** can be described as a self-regulated learner. A learner who *intends, who wills* to learn something, sets a goal and develops a plan to achieve his learning goal. This intentional learner also monitors and self-regulates his motivation, his behavior and some of the context features (Pintrich, 2000b), including social aspects of learning.

Intentional learners may set as one learning goal to change part of their knowledge. Then, an *intentional conceptual change* process may take place. Gale Sinatra and Paul edited recently a volume under this title “*Intentional Conceptual Change*” (Sinatra & Pintrich, 2003), where the role of the learner’s intentions in knowledge change is explored. Even if this concept of intentional conceptual change needs to be much further discussed and empirically explored, it has introduced the role of intentions, goals, metacognition and self-regulation in the discussion about conceptual change, accounting for a much more complex view than one which is reduced to prior knowledge restructuring.

I think *Paul has made a definitive contribution towards constructing and furthering research regarding this intentional learner.*

Paul believed that social and contextual aspects of learning should be much better integrated in this intentional learner in the near future. But this is another of the challenges he opened to all of us. He has opened many, new and exciting tracks for developing further research and for continuing what he unfortunately will be unable to pursue.

It was a great privilege to have him involved in our SIG, to benefit from his intellectual contributions and to enjoy his friendship.”

Just a final remark here, to add my thanks to Paul for putting his trust in me, for his great and always warm support during all these years we have been collaborating (when it was most needed he was always there), for his great sense of humor I enjoyed so much, for giving me the opportunity to learn so many things from him at all levels, and for allowing me to share with him so many good times and so many engaging conversations about Psychology and Education. Using our field terminology, he was for me a kind of “anomalous data”, enough to provoke me to radical conceptual change. “Thank you for everything”. These were the last words I told him when we last met in Chile, one month before he passed away, and with which I also wish to finish these remarks.

References

Hofer, B.K., & Pintrich, P.R. (1997). The development of epistemological theories : beliefs about knowledge and knowing and their relation to learning. *Review of Educational Research*, 67 (1), 88-140.

- Hofer, B.K., & Pintrich, P.R. (2002). *Personal Epistemology. The psychology of beliefs about knowledge and knowing*. Mahwah, NJ: Erlbaum.
- Limón, M. (2001). *Memoria de oposición*. Madrid: Universidad Autónoma.
- Pintrich, P.R. (2000a). Educational Psychology at the Millenium: A look back and a look forward. *Educational Psychologist*, 35 (4), 221-226.
- Pintrich, P.R. (2000b). The role of goal orientation in self-regulated learning. In M. Boekaerts, P.R. Pintrich, & M. Zeidner (Eds.), *Handbook of Self-regulation* (pp. 452-502). San Diego : Academic Press.
- Pintrich, P.R. (2002). Conclusion: Future challenges and directions for theory and research on personal epistemology. In B.K. Hofer & P.R. Pintrich (Eds.), *Personal Epistemology. The psychology of beliefs about knowledge and knowing* (pp. 389-414). Mahwah, NJ: Erlbaum.
- Pintrich, P.R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology*, 95(4), 667-686.
- Pintrich, P.R.; Marx, R.W. & Boyle, R.A. (1993). Beyond cold conceptual change: the role of motivational beliefs and classroom contextual factors in the process of conceptual change. *Review of Educational Research*, vol. 63 (2), 167-200.
- Sinatra, G.M. & Pintrich, P.R. (Eds.)(2003). *Intentional Conceptual Change*. Mahwah, NJ: Lawrence Erlbaum Associates.

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Paul and she participated and organized numerous sessions on Conceptual Change and Epistemological beliefs in AERA and EARLI Conferences and SIG meetings since 1994. She also collaborated with Paul on two recent books on Conceptual Change: Limón, M. & Mason, L.(Eds.)(2002), *Reconsidering Conceptual Change: Issues in Theory and Practice*. Dordrecht, The Netherlands: Kluwer Academic Press and Sinatra, G.M. & Pintrich, P.R. (Eds.)(2003). *Intentional Conceptual Change*. Mahwah, NJ: Lawrence Erlbaum Associates.

She was also beginning to develop some new teaching and research projects with Paul in South America, for this reason they organized a workshop (Current Issues in Learning and

Instruction) in Santiago de Chile (Chile) in June, 2003. They planned the translation into Spanish of Paul and Dale Schunk's book, *Motivation in Education*, 2nd edition, to be published in 2004, and they were currently working on new publications.

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Meeting Challenges in Research on Self-Regulated Learning: Contributions of Paul R. Pintrich

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Abstract

In his commentary Professor Winne highlights three ways Paul R. Pintrich contributed to developing the field of self-regulated learning: as collaborative guide and benevolent governor of work in the field, as empirical researcher, and as insightful and constructive theoretician with an ever-watchful concern for educational practice. Winne illustrates these contributions from Paul Pintrich.

Keywords: Self-regulated learning/ Intentional learning/ Cognitive Psychology/Motivation Goals

Over the past two decades, theory and research on self-regulated learning (SRL) have built on foundations laid by the cognitive revolution in psychology. In particular, SRL theory elaborates the influential test-operate-test-exit unit proposed by Miller, Galanter, and Pribram (1960) in a way that not merely preserves but accentuates learners' humanity. It does this by a simple yet profound axiom: Learners are agents. Agents make choices about how they behave. Their choices are grounded in but not determined by the environments they inhabit. Perhaps most significantly, agents and the environments they inhabit interact over time such that each shapes the other's development. Because SRL theory adopts a view of learning that is inherently dynamic and simultaneously unpredictable while not random, it poses special challenges to those who strive to understand its elements, their structure, and the means by which SRL accounts for human behavior and learning.

It is no exaggeration to count Paul R. Pintrich among the most influential, thoughtful, and collaborative scholars around the globe who have labored to advance theory and research on SRL. What is the evidence for my bold claim? I cite just three short examples among scores that can be listed.

With his close colleagues Monique Boekaerts of Leiden University, The Netherlands and Moshe Zeidner of the University of Haifa, Israel, Paul was an architect of the *Handbook of Self-Regulation* (2000). This encyclopedic collection of work on SRL brought together for the first time a panoramic display of what SRL was theorized to be, how SRL had been researched, and what effects had been associated with SRL. Paul's collaborative role in creating this unique resource is just one example of his dedication to a team-based approach to advancing work in the field directly and to cultivating resources that help others advance the science of SRL.

Empirical studies, like those that populate chapters in the *Handbook* Paul co-edited, provide the means for validating theory about SRL. The science of SRL would stall without meticulously designed, carefully executed, and lucidly presented reports of empirical research. Paul was a prolific and insightful empiricist whose work set standards for the field. A recent example is his study (2000) demonstrating that performance approach goals do not necessarily orient learners in ways that undermine adaptation or force learners to travel paths

that doom them to failure. A particularly advantageous feature of his study was demonstrating the longitudinal significance of goal orientation with respect to expressions of SRL, such as self-handicapping and risk taking. Overall, Paul's corpus of empirical studies built key bridges that joined the cognitive and motivational facets of SRL in ways that illuminated rather than complicated science in the field.

Theorists must absorb and occasionally wrestle with empirical work such as Paul's and that produced by others. As we continuously confront and, indeed, grapple with the challenges empirical work poses for theory, we in the field of SRL, like any other area of science, embody a self-regulating enterprise. Because SRL is such wide-scope view of human learning and change, synthesizing, constructively criticizing, and re-assembling data and re-interpreting findings are especially challenging. It is in this arena where Paul made enormous and frequent contributions to SRL science. One of Paul's (2003) last publications on motivation science illustrates his excellence in this capacity. In this paper, Paul tackled core concerns about motivation science, touching often on matters central to the science of SRL. In a mere 16 pages, he offered not only a solid synthesis of issues and grounded suggestions for educational practices. As well, he posed insightful guidelines for advancing the field yet further. This and others of his syntheses of research stand as models to be studied as well as offering conceptual tools for advancing the science of SRL. Through these publications, Paul's scholarly skills and insights will guide both science and educational practice for years to come.

In these three ways—as collaborative guide and benevolent governor of work in the field, as empirical researcher, and as insightful and constructive theoretician with an ever-watchful concern for educational practice—Paul's legacy to the field of SRL is distinctive, substantial, and seminal. I--and I predict confidently that scores of my colleagues who worked alongside him--will strive mightily to match the standards Paul set. It is a task we take up in honor of a most dear colleague.

References

- Boekaerts, M., Pintrich, P. & Zeidner, M. (Eds.), *Handbook of self-regulation*. Orlando, FL: Academic Press.
- Pintrich, P.R. (2000). Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology*, 92, 544-555.

Pintrich, P.R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology*, 94, 667-686.

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About Paul Pintrich's work: self-regulation of motivational and cognitive processes in educational settings

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Abstract

The aim of this paper is to present and discuss Paul Pintrich's work with regard to his theoretical model on self-regulated learning and motivation in educational settings. This model postulates that both motivational and cognitive elements can be self-regulated by the learner. At the same time, context plays an important role in learning, interacting with motivation and cognitive processes.

Keywords: Self-regulated learning/ Motivation/ Cognition/ Educational Psychology

From the beginning of his career as a researcher, Pintrich considered learning context and social factors to play an important role in classroom learning. His main contribution to this field of motivation and self-regulation was to both develop an integrative theoretical framework including cognitive, motivational and contextual elements, and to support it, presenting numerous empirical data that show the close relationships among these factors.

At the cognitive level, his work focused on researching how learning strategies are used and self-regulated, and at the motivational level, the role of goals and students' goal orientation (Pintrich, 2000 a).

Motivation, cognition and learning context in Pintrich's theoretical model

When explaining learning processes in classroom settings, Pintrich (1994, 2000b, 2003a) points out three types of elements:

- a) *Motivational elements*, such as achievement goal orientation, expectancies for success and failure, self-perceptions of ability and competence (self-efficacy beliefs), control beliefs, task value and affective and emotional reactions.
- b) *Cognitive elements*, such as cognitive self-regulation strategies, learning strategies, metacognition, activation of prior knowledge, etc.
- c) *Learning context elements*, such as task features, classroom context, students' perception of both the task features and the classroom contexts, goals promoted in the classroom, type of work structure, teaching methods, teacher's behavior, type of interactions between teachers and students.

Pintrich considers the existence of a bidirectional relationship among these three types of elements, all closely related (García & Pintrich, 1994, Pintrich, 2000b). In the following sections we will explain these relationships more in detail.

Motivational elements in Pintrich's theoretical framework

Pintrich considers motivation a multifactorial construct (Linnenbrink & Pintrich, 2002b). Here we mention just two factors involved in motivation, those most developed by

Pintrich in his work: *the role of students' goal orientation and students' self-efficacy beliefs* (for a detailed review of Pintrich's understanding of motivation, see Pintrich, 2003a and Pintrich, 2002).

Pintrich (2000a) introduced a taxonomy which includes four possible types of students' goal orientation: approach mastery goals, avoidance mastery goals, approach performance goals, avoidance performance goals (Linnebrink & Pintrich, 2000). These four possibilities are the result of combining two dimensions: goal orientation (mastery versus performance goals) and approach/avoidance focus towards them (Pintrich, 2002).

This taxonomy enlarges the traditional one proposed by normative goal theory, which distinguished between mastery and performance goal orientations, and only considered the approach/avoidance dimension in the case of performance goals. Each of these potential goal orientations involves different relationships with the other elements involved in self-regulated learning (Linnenbrink & Pintrich, 2000; Pintrich, 2000b).

Goal orientations lead students to engage with and confront learning tasks in different ways. In order to demonstrate his theoretical framework, Pintrich studied students' goal orientations across different disciplines and contexts (Wolters, Yu & Pintrich, 1996; Pintrich & Zusho, 2001). He also studied the differences between students' goal orientations and students' perception of classroom goals (Linnenbrink & Pintrich, 2002a). He found a reciprocal relationship between these two aspects.

Ever since his first papers (see, for example Blumenfeld, Pintrich, Meece & Wessels, 1982; Pintrich & Blumenfeld, 1985; Blumenfeld, Pintrich & Hamilton, 1986), Pintrich studied students' self-efficacy beliefs. He considered them a key element to predict both students' degree of engagement in tasks and their achievement (Linnenbrink & Pintrich, 2003). Self-efficacy beliefs influence not only students' motivation, but also their behavior and cognitive processes activated during task performance.

Pintrich's results show that motivational elements may be more or less relevant or they may even play different roles throughout the learning process. For instance, Pintrich & De Groot (1990) found that intrinsic task value is particularly important to predict the learner's initial engagement. Also, at the beginning of a task, learners adopt a particular goal

orientation (Pintrich, 2000b) that is adjusted during performance and may be changed along the way.

However, other elements such as *self-efficacy beliefs* have a significant role in later steps of task performance. Emotional reactions appear when learners have finished their task as consequences of causal attributions generated to explain success or failure. These attributions may change individuals' self-efficacy perception, expectancy for success and task value (Pintrich & Schunk, 2002). Thus it seems clear that a significant interaction among motivational elements during the learning process does exist and this interaction may be different at different steps of task performance.

Relationships between cognitive and motivational elements

According to Pintrich (2003b), integrating cognitive and motivational elements is necessary both for completing our understanding of learning processes in school contexts and for understand difficulties that may appear during the instructional process.

Many of his papers (e.g. Pintrich & De Groot, 1990; Pintrich, Roeser & De Groot, 1994; Pintrich & Zusho, 2002) related motivational and cognitive elements, particularly the use of self-regulation strategies (for a review, see Pintrich, 2000b). They showed that motivational processes may facilitate or hinder self-regulation (Pintrich & Zusho, 2002).

For instance, individuals with a particular type of goal orientation –i.e. mastery oriented– would make more trials to control their own cognition and use learning strategies more frequently (Pintrich & De Groot, 1990; Pintrich et al., 1994).

Also, learner's self-efficacy perception and intrinsic value assigned to task are related to individuals' cognitive engagement and achievement (Pintrich & De Groot, 1990). Motivational and cognitive elements are so closely related that it is possible to identify several cognitive/motivational profiles of students' behavior (Pintrich & García, 1993).

Relationships among motivational and cognitive processes and the learning context

For Pintrich, context is an essential element in learning processes. Pintrich (1994) stresses the relationship between motivational beliefs and the potential influence of some context features on students' motivation. (Linnebrink & Pintrich, 2001, 2003).

His view, in contrast with other well-known theoretical models (e.g. Bandura, 1997; Csikszentmihalyi, 1988; Deci & Ryan, 1985; Dweck & Elliott, 1983) holds that students' motivation is not only influenced and controlled by the individual himself, but also by the context. The learning context in turn may also be modified by students' behavior. Therefore, for Pintrich it was clear that any motivational intervention in students' learning should involve individuals as well as the learning context surrounding them.

This point explains why he never lost sight of the applications of his theoretical framework to educational practice. Particularly, his research was motivated by the aim to develop optimal learning contexts which facilitate learning. He emphasized the role of teachers to create this optimal learning context. At the same time, he also insisted on the need for teaching learners how to become efficient self-regulated learners (Hofer, Yu & Pintrich, 1998; Pintrich, 2000b).

References

- Bandura, A. (1997). *Self-Efficacy: The exercise of control*. New York: Freeman.
- Blumenfeld, Ph.C., Pintrich, P.R., & Hamilton, V.L. (1986). Children's concepts of ability, effort, and conduct. *American Educational Research Journal*, 23(1), 95-104.
- Blumenfeld, Ph.C., Pintrich, P.R., Meece, J., & Wessels, K. (1982). The formation and role of self perceptions of ability in elementary classrooms. *Elementary School Journal*, 82(5), 401-420.
- Csikszentmihalyi, M. (1988). The flow experience and its significance for human psychology. In M. Csikszentmihalyi & I.S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp.15-35). Cambridge, MA: Cambridge University Press.
- Deci, E.L., & Ryan, R.M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.
- Dweck, C.S., & Elliott, E.S. (1983). Achievement motivation. In P.H. Minsien & E.M. Hetherington (Eds.), *Handbook of child psychology, vol IV: Social and personality development* (pp. 643-691). New York, NY: Wiley
- García, T., & Pintrich, P.R. (1994). Regulating motivation and cognition in the classroom: The role of self-schemas and self-regulatory strategies. In D.H. Schunk & B.J. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp. 127-153). Hillsdale, NJ: Lawrence Erlbaum Associates.

- Hofer, B.K., Yu, Sh.L., & Pintrich, P.R. (1998). Teaching college students to be self-regulated learners. In D.H. Schunk & B.J. Zimmerman (Eds.), *Self-regulated learning: From teaching to self-reflective practice* (pp.57-85). New York, NY: Guilford Publications.
- Linnenbrink, E.A., & Pintrich, P.R. (2000). Multiple pathways to learning and achievement: The role of goal orientation in fostering adaptive motivation, affect and cognition. In C. Sansone & J.M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp.195-227). San Diego, CA: Academic Press.
- Linnenbrink, E.A., & Pintrich, P.R. (2001). Multiple goals, multiple contexts: The dynamic interplay between personal goals and contextual goal stresses. In S. Volet & S. Järvelä (Eds.), *Motivation in learning contexts: Theoretical advances and methodological implications* (pp. 251-269). Elmsford, NY: Pergamon Press.
- Linnenbrink, E.A., & Pintrich, P.R. (2002a). Achievement goal theory and affect: An asymmetrical bidirectional model. *Educational Psychologist*, 37(2), 69-78.
- Linnenbrink, E.A., & Pintrich, P.R. (2002b). Motivation as an enabler for academic success. *School Psychology Review*, 31(3), 313-327.
- Linnenbrink, E.A., & Pintrich, P.R. (2003). The role of self-efficacy beliefs in student engagement and learning in the classroom. *Reading & Writing Quarterly: Overcoming learning difficulties*, 19(2), 119-137.
- Pintrich, P.R. (1994). Student motivation in the college classroom. In K.W. Prichard & R.M. Sawyer (Eds.), *Handbook of college teaching: Theory and applications* (pp. 23-43). Westport, CT: Greenwood Press/Greenwood Publishing Group.
- Pintrich, P.R. (2000a). Multiple Goals, Multiple Pathways: The role of Goal Orientation in Learning and Achievement. *Journal of Educational Psychology*, vol.92 (3), 544-555.
- Pintrich, P.R. (2000b). The role of goal orientation in self-regulated learning. In M. Boekaerts, P.R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 452-502). San Diego, CA: Academic Press.
- Pintrich, P.R. (2002). The role of goals and goal orientation. In P.R. Pintrich & D.H. Schunk (Eds.), *Motivation in education: Theory, research, and applications. 2nd edition* (pp. 190-242). Englewood Cliffs, NJ: Prentice Hall. Spanish translation, *Motivación y educación: teoría, investigación y aplicaciones*. Madrid: Pearson-Prentice Hall, 2004.
- Pintrich, P.R. (2003a). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology*, 95(4), 667-686.

- Pintrich, P.R. (2003b). Motivation and classroom learning. In W.M. Reynolds & G.E. Miller (Eds). *Handbook of Psychology: Educational Psychology, Vol. 7* (pp.103-122). New York, NY: John Wiley & Sons.
- Pintrich, P.R., & Blumenfeld, Ph.C. (1985). Classroom experience and children's self-perceptions of ability, effort, and conduct. *Journal of Educational Psychology, 77*(6), 646-657.
- Pintrich, P.R., & de Groot, E.V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82*(1), 33-40.
- Pintrich, P.R., & García, T. (1993). Intraindividual differences in students' motivation and self-regulated learning. *Zeitschrift fuer Paedagogische Psychologie, 7*(2-3), 99-107.
- Pintrich, P.R., Roeser, R.W., & de Groot, E.V. (1994). Classroom and individual differences in early adolescents' motivation and self-regulated learning. *Journal of Early Adolescence, 14*(2), 139-161.
- Pintrich, P.R., & Schunk, D.H. (2002). *Motivation in education: Theory, research, and applications. 2nd edition*. Englewood Cliffs, NJ: Prentice Hall. Spanish translation, *Motivación y educación: teoría, investigación y aplicaciones*. Madrid: Pearson, 2004.
- Pintrich P.R., & Zusho, A. (2001). Goal orientation and self-regulated learning in the college classroom: A cross-cultural comparison. In F. Salili & Ch. Chiu (Eds.), *Student motivation: The culture and context of learning* (pp. 149-169). Dordrecht, Netherlands: Kluwer Academic Publishers.
- Pintrich P.R., & Zusho, A. (2002). The development of academic self-regulation: The role of cognitive and motivational factors. In A. Wigfield & J.S. Eccles (Eds.), *Development of achievement motivation* (pp. 249-284). San Diego, CA: Academic Press.
- Weiner, B. (1986). *An attributional theory of motivation and emotion*. New York: Springer-Verlag.
- Wolters, Ch.A., Yu, Sh.L., & Pintrich, P.R. (1996). The relation between goal orientation and students' motivational beliefs and self-regulated learning. *Learning and Individual Differences, 8*(3), 211-238.

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Montero met Paul Pintrich several times at AERA Conferences and when Paul was invited to give some talks and participate in several meetings at the Autónoma University of Madrid. Recently, he collaborated in the translation of Paul and Dale Schunk's book *Motivation in Education*, 2nd edition, to be published by Pearson-Merrill Prentice Hall in 2004.

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The human factor

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Abstract

Throughout her commentary, Dr. Alexander stresses Paul Pintrich's extraordinary capacity to mentor young students and to nurture and support other colleagues, in addition to his academic and professional contributions. Pintrich possessed in abundance several characteristics critical to a good mentor, including: knowledge of and perspective on the field; the respect and admiration of the community; an ability to work well with others; and a true passion for the domain.

Keywords: Mentoring/ Education/ Educational Psychology/ Learning/ Teaching

When members of the research community assess the scholarly contributions of a colleague, those contributions are typically weighed in terms of numbers of refereed publications, citation rates, highly-touted volumes, editorial responsibilities, leadership positions, honors and awards, and presentations at national and international research conferences. By any of these quantifiable measures, Paul R. Pintrich was a scholar of the first order. For example, Paul's role in framing the agenda for research in educational psychology is well documented by contributors to this special issue in such areas of investigation as epistemological beliefs, conceptual change, motivation, and self-regulation. Thus, I will leave it to my esteemed colleagues to delve more deeply into Paul's significance to these realms of inquiry.

Yet, achievements to a field like educational psychology cannot be measured solely in terms of publications and presentations. There is the human factor to consider as well. To be more precise, scholars of the first order invest themselves aggressively and energetically in the nurturing of others who will hopefully become the next generation of scholars; thus ensuring the continued health and prosperity of the domain. It is for his extraordinary capacity to mentor young scholars that I celebrate the contributions of Paul R. Pintrich to educational psychology.

Just the list of former Michigan graduate students mentored by Paul is impressive. So many of those former students are already making their marks on the field of educational psychology, among them are Eric Anderman, Lynley Anderman, Teresa Garcia, Barbara Hofer, Elizabeth Linnenbrink, Timothy Urdan, and Christopher Wolters. Through the graduate student organizations within the American Educational Research Association (AERA) and Division 15 (Educational Psychology) of the American Psychological Association (APA), Paul was able to affect the professional lives of graduate students from institutions across the United States. But it was not only graduate students who were the benefactors of Paul's wisdom. Several scholars contributing to this volume have also benefited from their collaboration with Paul Pintrich—myself included.

The ability to support the academic development of those at differing stages of their professional career seems predicated on several critical characteristics of the mentor including: knowledge of and perspective on the field; the respect and admiration of the community;

an ability to work well with others; and a true passion for the domain. Paul possessed all these characteristics in abundance. For example, quality mentors must have an extensive knowledge of the domain in which they operate and the ability to communicate that knowledge to others. It is clear from his many scholarly publications that Paul had a special vantage point on the field of educational psychology and could synthesize complex and extensive literatures brilliantly (e.g., Hofer & Pintrich, 1997, Pintrich, 1994; 2003; Pintrich, Marx, & Boyle, 1993; Pintrich & Schunk, 2001).

Second, the quality mentor must command the respect of the community at large, as well as of those who would learn from him or her. In this regard, Paul's leadership within the domain of educational psychology has been firmly established. Among his many leadership roles were Past President of Division 15 of APA, former editor of *Educational Psychologist*, and member of many editorial boards.

Further, Paul repeatedly demonstrated his ability to work with others, while never wavering in the standards he held for members of the research community. This ability to maintain support and guidance on the one hand and high expectations for scholarship on the other is not easily achieved. Yet Paul accomplished this end with grace and with a sustained passion for the pursuit of knowledge.

Thus, as we celebrate Paul's many contributions to the field of educational psychology, as we remember his scholarship to literatures in epistemological beliefs, conceptual change, motivation, and self-regulation, let us remember his contributions to members of the research community in the form of exceptional mentoring. It is through knowledgeable, respected, capable, and passionate mentors that the future of domains, like educational psychology, is ensured. There is no question that Paul R. Pintrich possessed all these qualities to an exceptional level. He was a mentor of unparalleled knowledge, highly respected within the field, and passionate about educational psychology. The field of educational psychology will forever be changed for the better by his contributions to community members—the human factor that has touched me and so many others.

References

- Hofer, B.K., & Pintrich, P.R. (1997). The development of epistemological theories: Beliefs about knowledge and knowing and their relation to learning. *Review of Educational Research, 67*, 88-140.
- Pintrich, P.R. (1994). Continuities and discontinuities: Future directions for research in Educational Psychology. *Educational Psychologist, 29*, 137-148.
- Pintrich, P.R. (2000). An achievement goal theory perspective on issues in motivation terminology, theory, and research. *Contemporary Educational Psychology, 25*, 92-104.
- Pintrich, P.R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology, 95*, 667-686.
- Pintrich, P.R., Marx, R.W., & Boyle, R.A. (1993). Beyond cold conceptual change: The role of motivational beliefs and classroom contextual factors in the process of conceptual change. *Review of Educational Research, 63*, 167-199.
- Pintrich, P.R., & Schunk, D.H. (2001). *Motivation in education: Theory, research, and applications* (2nd ed.). Englewood Cliffs, NJ: Prentice Hall.

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She is Past President of Division 15 (Educational Psychology) of the American Psychological Association, and Vice-President of Division C (Learning and Instruction) of the American Educational Research Association. Professor Alexander is a Fellow of the American Psychological Association, and was a Spencer Fellow of the National Academy of Education. Recently, she was named one of the 10 most productive scholars in Educational Psychology, and was the 2001 recipient of the Oscar S. Causey Award for outstanding contributions to literacy research from the National Reading Conference. In addition, she has received various national, university, and college awards for teaching.

At the time of his death, Drs. Alexander and Pintrich were serving as the co-editors of the forthcoming edition of the Handbook of Educational Psychology to be published by Lawrence Erlbaum Associates.

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The International Dimension of Paul Pintrich

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Abstract

Dr. De Corte highlights Paul Pintrich's international orientation as a scholar. He also comments on his involvement in EARLI and the IAAP and how he tried to develop links among the international community to improve research and to spread knowledge about Psychology and Education.

Keywords: Learning/ Educational Psychology/ Education

As shown in the preceding contributions, Paul Pintrich's contributions to the advancement of the field of educational psychology – theoretically, methodologically, and empirically – have been extensive in quantity but also very substantial in quality.

However, besides being an excellent scholar, Paul was also a wonderful person with a broad interest, a critical outlook on societal developments, and a good sense of humor. Meeting and talking with him has always been a pleasant and, at the same time, enriching experience for me.

What I would like to highlight here especially is Paul's international orientation as a scholar, a characteristic that is today still not so obvious for American educational researchers. Indeed, whereas it is undeniable that globalization affects also the scholarly community, American educational research is still largely parochial. Paul, like his mentor Bill McKeachie and another deplored colleague and friend Dick Snow, was one of the notable exceptions. Illustrative in this respect is that at the time of his decease he was the President of Division 5 on Educational, Instructional, and School Psychology of the International Association of Applied Psychology (IAAP). But to me the major evidence of Paul's international orientation was his interest and involvement in the European Association for Research on Learning and Instruction (EARLI). I remember his lively enthusiasm when he participated for the first time in an EARLI-related activity, namely the International Symposium on Conceptual Change which was held from 1 to 3 September 1994 at the Friedrich-Schiller-University of Jena, Germany. Since then Paul has progressively more and more become an active participant in EARLI Conferences, and a real ambassador for EARLI in the United States. Because of his affinity with EARLI, he was very pleased with the invitation to present a Keynote address at EARLI's 10th European Conference for Research on Learning and Instruction in August 2003 in Padua, Italy, where he would have spoken about *Multiple goals and multiple pathways in the development of motivation and self-regulated learning*.

A last indication of his strong motivation to internationalize research on learning and instruction was his support for (in his capacity of President of Division 5 of IAAP and jointly with the EARLI Executive Committee) and involvement in the "Seminario Internacional" on "*Current issues in learning and instruction*", held in Santiago de Chile at the Universidad

Cardenal Raúl Silva Henríquez, organized jointly by this university and the Universidad Santo Tomás, from June 2-4, 2003. It was there that I met Paul for the last time, looking very healthy, dynamic as ever, and full of plans for the future. Therefore, his passing away one month later was at first unbelievable. We all will miss him as a leading colleague but also as a good friend. Our tribute to him should be to continue our efforts to do research in learning and instruction that meets his high standards, with a view to improving education for all children worldwide.

Erik De Corte is Professor of Educational Psychology at the University of Leuven, Belgium. His major research interest is to contribute to the development of theories of learning from instruction and the design of powerful learning environments, focusing thereby on learning, teaching, and assessment of thinking and problem solving, especially in mathematics. He was one of the founders and the first President (1985-1989) of the European Association for Research on Learning and Instruction (EARLI). He was the founding editor of the EARLI-journal *Learning and Instruction* (1990-1993), and from 1987 till 2002 associate editor of the *International Journal of Educational Research*. He co-edited (with F.E. Weinert) the *International encyclopedia of developmental and instructional psychology* (1996). In 1997 he received the "Oeuvre Award for Outstanding Contributions to the Science of Learning and Instruction" of the European Association for Research on Learning and Instruction (EARLI), and in 2002 the "Award for Outstanding Contribution to Educational Psychology" of the Division "Educational, Instructional, and School Psychology" of the International Association of Applied Psychology. He is a Fellow of the Royal Norwegian Society of Sciences and Letters, Class of Humanities, and of the Academia Europaea; he is also a Foreign Associate of the National Academy of Education of the U.S.A. Currently he is President of the International Academy of Education (1998-2006). In 2000 he was conferred the doctorate honoris causa of the Rand Afrikaans University, Johannesburg, South Africa, and in 2003 of the University of the Free State, Bloemfontein, South Africa.

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Tribute to Paul R. Pintrich

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Abstract

Dr. Mayer outlines four contexts in which he knew Paul Pintrich: as an active contributor to educational psychology, as an intellectual leader in shaping educational psychology, as a consistent advocate for international collaboration and as a loyal supporter of his home institution and his discipline.

Keywords: Educational Psychology/ Learning / Teaching.

Educational psychology lost a dear friend with the tragic death of Paul Pintrich. Paul was a leader in our field and a source of inspiration for those who knew him. I had the privilege of knowing Paul in many contexts--including his role as a contributor, leader, advocate, and supporter.

Paul Pintrich as an active contributor to educational psychology. First and foremost, Paul Pintrich helped produce the kind of theory-grounded research base that is essential for the scientific progress of educational psychology. In particular, his research productivity over the years has helped to clarify the role of motivational, metacognitive, and attitudinal factors in learning. Anyone who wants to write a complete explanation of how students learn cannot help but be influenced by Paul's careful and clear research on how the learner's metacognitive beliefs and motivation affect learning. I have learned much from reading his published work, attending his conference presentations, and discussing his research with him.

Paul Pintrich as an intellectual leader in shaping educational psychology. Several years ago I had the pleasure of working with Paul Pintrich and a few others on a revision of Bloom's taxonomy. We were called to a series of meetings in Syracuse by David Krathwohl, who had helped write the original taxonomy in 1956. Our intellectual challenge was to review the progress in our field since the mid-1950s, and see how to incorporate new advances into a revised taxonomy of educational objectives. In our meetings Paul was an intellectual leader who displayed a broad grasp of the field. He convinced the group that an important new feature of learning involved metacognitive knowledge, so the taxonomy was revised accordingly.

Paul Pintrich as a consistent advocate for international collaboration. Paul Pintrich was a leader in our field's primary professional organization, the Division of Educational Psychology of the American Psychological Association, including serving as its President and Editor of its journal, the *Educational Psychologist*. Over the years I had the honor of working with Paul in various leadership roles within the Division. At every opportunity, Paul Pintrich was a strong advocate for international collaboration. He was instrumental in encouraging North American educational psychologists to get more involved in conducting research with international colleagues, and he helped build strong ties with EARLI.

Paul Pintrich as a loyal supporter of his home institution and his discipline. Finally, Paul Pintrich was a loyal supporter of his home institution, the University of Michigan. As a fellow graduate of Michigan, I respected and shared his love of Ann Arbor. The University of Michigan could not have asked for a better advocate than Paul Pintrich.

Surely, our field has lost a friend and so have I.

Richard E. Mayer is Professor of Psychology at the University of California, Santa Barbara (UCSB) where he has served since 1975. He received a Ph.D. in Psychology from the University of Michigan in 1973, and served as a Visiting Assistant Professor of Psychology at Indiana University from 1973 to 1975. His research interests are in educational and cognitive psychology. His current research involves the intersection of cognition, instruction, and technology with a special focus on multimedia learning and problem solving.

He is past-President of the Division of Educational Psychology of the American Psychological Association, former editor of the *Educational Psychologist* and former co-editor of *Instructional Science*, former Chair of the UCSB Department of Psychology, and the year 2000 recipient of the E. L. Thorndike Award for career achievement in educational psychology. He was ranked #1 as the most productive educational psychologist for 1991-2001 (*Contemporary Educational Psychology*, vol. 28, pp. 422-430).

He is on the editorial boards of 11 journals mainly in educational psychology. He is the author of 18 books and more than 250 articles and chapters, including *The Promise of Educational Psychology* (1999) and *Multimedia Learning* (2001).

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