



ISSN 1648-3898

Abstract. *In this study, science (physics, chemistry and biology) undergraduate students' perceptions about the roles of student and lecturer, nature of knowledge, and student's task in examination was investigated. Besides, comparison of students' perceptions was made in these four points with four class levels. A version of Perry Model developed by Finster was used in this study. This model shows how students develop from a simplistic stance on the nature of knowledge to one which is more pluralistic and contextual. The results showed that university learning environment positively effected the science undergraduate students' perceptions about role of lecturer, taking responsibility for their own learning, autonomous learning, and self expression. In addition, obtained findings can be a guide for redesign of learning environments in undergraduate science education.*

Key words: *Perry model, intellectual development, the process of learning, students' perceptions.*

Erdal Senocak, Cezmi Unal
Gaziosmanpasa University, Education
Faculty, Department of Elementary
Education, Turkey

TURKISH UNDERGRADUATE STUDENTS' PERCEPTIONS ON THE FACTORS AFFECTING THE PROCESS OF THEIR LEARNING

Erdal Senocak, Cezmi Unal

© Erdal Senocak

© Cezmi Unal

Introduction

Several theorists have argued that the ability to reason in context develops over time (Baxter-Magolda, 1987; Hofer & Pintrich, 1997; King & Kitchener, 1994; Perry, 1970). Although the theories differ in detail and scope, they suggest overall, a common pattern of development that progresses from simple, black-white thinking, through an exploration of multiple perspectives, to complex, relativistic thinking. In this study, we chose the Perry model of intellectual development, the earliest and most thoroughly tested of these theories, as the conceptual framework to guide our research.

Some researchers, such as Finster, (1991), Katung, Johnstone & Downie (1999), and Mackenzie, Johnstone, & Brown (2003) used Perry model to classify students' views about the roles of student and lecturer, nature of knowledge, and student's task in examination. Students' attitudes were monitored with the Perry model of intellectual development with respect to the way they reacted or adapted to changes. This model shows how students develop from a simplistic stance on the nature of knowledge to one which is more pluralistic and contextual.

Perry (1970) undertook a major study of forms of intellectual development in the college years. From a series of intensive interviews with undergraduate students at Harvard University, he identified a sequence he termed 'positions' which represent ways in which students view themselves and their learning, how they make meaning of their world, and how they interpret and make sense of the classroom environment, how they view knowledge and the process of learning and how they understand the roles of the



teacher and the students in this process. The model, therefore, describes a broad framework of student progress during their educational programme. Perry has been noted as having related academic experience most dearly to qualitative changes in students' thinking and moral development. Perry originally identified nine 'Positions' (Dawson, 2004):

- Position 1:* The student views knowledge as either correct or incorrect. Knowledge is construed as an accumulation of facts collected through hard work and obedience.
- Position 2:* The student recognizes that there are conflicting opinions, but views some as correct and others as incorrect.
- Position 3:* Diversity and uncertainty are accepted, but only because the "answer" has not yet been found.
- Position 4:* The student comes to the conclusion that everyone is entitled to her own opinion, though right and wrong still prevail in the realm of authority.
- Position 5:* The student views all knowledge as contextual.
- Position 6:* The student comes to understand that it is necessary for him to commit to a position within a relativistic world.
- Position 7:* This commitment is made.
- Position 8:* The implications of commitment are explored as are notions of responsibility.
- Position 9:* The individual situates herself within an identity that incorporates multiple responsibilities, and views commitment as an ongoing process through which the self finds expression.

Later researchers have reduced the number of Positions to three or four (Katung et al., 1999). We utilised a three stage version of Perry's scheme; 'A' Position or 'Dualism' (representing Perry's Positions 1 and 2); 'B' Position or 'Multiplicity' (representing Positions 3 and 4); 'C' Position, or 'Relativism' (representing Positions 5-9). The model was used in this study as a tool to identify the ways in which students think and to look for changes among class levels.

Perry's initial, longitudinal study investigated changes in thinking among undergraduates and the ways in which they made sense of their educational experience. The outcome of his research was an outline of intellectual development in which he described a series of nine 'Positions' or stages, together with their associated transitions, in the individual's developmental journey. Each Position reflected learning taken place. Perry conceptualised the Positions as representing a hierarchical the person's way of thinking about the world and self, as well as knowledge and how sequence in which individuals moved from relatively simple ways of thinking to highly complex ways of perceiving and evaluating knowledge and the world. At one extreme ('Dualism') are students who see knowledge consisting of 'right answers', 'taught' by the lecturer, and whose responsibility is to return memorised 'facts' in assessments. At the other extreme ('Relativism') are students who are analytical, independent learners, who see their task as demonstrating that they can evaluate possible solutions to problems on the basis of evidence. 'Knowledge' is seen as not absolute, and the student copes with this uncertainty by taking into account the settings in which decisions are made. The lecturer is expected to provide knowledge within a context and to demonstrate evidence for a decision or opinion. Within the scheme, the individual's 'ways of seeing the world' are reorganised as the person confronts social and intellectual challenges, either by chance through social situations, or by design through an educational programme.

There have been criticisms of the scheme and Perry's research methodology. For instance, it has been claimed that one Position should not be regarded as 'better' than another (Salner, 1986). However, it is difficult to view 'Dualist' and 'Relativist' Positions as equally desirable for students in higher education. Indeed, much of the 'Perry' research in educational settings seemingly has tried to determine how best to challenge students to encourage them to move to 'higher' Positions



(Finster, 1991). Also, participants in Perry's initial study were Harvard undergraduates, not necessarily representative of students in general, with major analyses based on male interviewees, although a quarter of participants were women.

Despite such criticisms, there seems to be agreement in the literature about Perry's important contribution to understanding learning from the student's perspective, and his work has generated copious research in diverse areas of post-school education, including medicine, law, engineering, science and teacher training (Hettich, 1988; Moore, 1990; Marra & Palmer, 2004).

Table 1. Description of 'Positions' in three-stage version of Perry's scheme of intellectual development (Mackenzie, Johnstone & Brown, 2003).

Perceptions of:	Student in Position 'A'	Student in Position 'B'	Student in Position 'C'
Student's role	Passively accepts	Realises that some responsibility rests with the student. But what? And how?	Sees student as source of knowledge or is confident of finding it. Discusses, and makes own decisions
Role of lecturer	Authority, giving facts and know-how	Authority. Where there are controversies, wants guidance as to which view is favoured by staff	Authority among authorities. Values views of peers. Member of staff as facilitator
Nature of knowledge	Factual; black and white; clear objectives; non-controversial; exceptions unwelcome	Admits 'black-and-white' approach not always appropriate. Feels insecure in the uncertainties this creates	Wants to explore contexts; seeks interconnections; enjoys creativity; scholarly work
Student's task in examinations	Regurgitation of 'facts'. Exams are objective. Hard work will be rewarded	Quantity is more important than quality. Wants to demonstrate maximum knowledge	Quality is more important than quantity. Wants room to express own ideas and views.

The purpose of this study was to examine the university science students' intellectual development and to make comparison among the class levels according to Perry Model with the Turkish sample of students.

Methodology of Research

Sample

The sample of the study was composed of total of 471 (216 female, 255 male) undergraduate students from Departments of Physic, Department of Chemistry, and Department of Biology at the Education Faculty of Ataturk University in Turkey at the first semester of 2003-2004 academic year. Most of the students in these departments took part in the study. There are four class levels (freshman, sophomore, junior, and senior) in all the departments (see table 2).



Table 2. Distribution of students according to gender and class levels.

Class Level	Gender		Total (n)
	Female (n)	Male (n)	
Freshman	48	72	120
Sophomore	60	51	111
Junior	51	69	120
Senior	57	63	120
Total	216	255	471

Data Collection Instrument

One problematic area in intellectual development research is the measurement of an individual's point of view or "Position" within Perry's scheme. Originally, Perry used unstructured interviews like early studies. Subsequently other instruments were developed, such as structured interviews, paraphrasing and restatement tasks, and semi-structured essays (Moore, 1989). Although these instruments produce extremely rich data, many are inappropriate for large groups. Therefore, Finster (1989) devised a questionnaire incorporating sentence stems of the kind used in previous Perry-related research. Finster's questionnaire measures the 'A', 'B', and 'C' positions shown in Table 1 (Mackenzie et al, 2003). A student in Position 'A' ('Dualist'), for example, might be expected to agree with views about the nature of knowledge and the roles of lecturer and student described in Table 1, column 2. Conversely, a student in Position 'C' ('Relativist') might be expected to disagree with such views. Four sentence stems referred to the four elements of learning. In each stem, students were asked to choose one answer from the three provided choice (representing 'A', 'B' and 'C' positions). Each set of three answers was presented, not in the sequence of Perry scheme, but randomly.

Turkish translation of the Finster's questionnaire was used in this study. With the permission of the developer of the original questionnaire, experts who are familiar with both culture translated the items of the original scale into Turkish. Turkish language experts rated the items of the Turkish form of the scale from the point of view of Turkish language regulation. The consistency and the external reliability of the Turkish questionnaire were examined with a pilot study. Questionnaire drafts were discussed with student representatives and staff, and then finalised after piloting.

Results of Research

The descriptive analysis technique was used to explain the obtained results. These results were interpreted with table and column diagrams. Table 3 shows that distribution of students' responses as the number of students.



Table 3. Distribution of students' response to the four sentence stems as the number of students.

Class Levels	Sentence stem 1 My job as a student is:			Sentence stem 2 I think that the lecturer's job is:			Sentence stem 3 I think that knowledge is:			Sentence stem 4 My job in my exam is:		
	A	B	C	B	C	A	A	C	B	A	C	B
	(D)	(M)	(R)	(M)	(R)	(D)	(D)	(R)	(M)	(D)	(R)	(M)
Freshman	3	21	96	42	72	6	54	27	39	63	45	12
Sophomore	0	21	90	21	87	3	45	27	39	45	57	9
Junior	6	21	93	12	102	6	18	24	78	24	75	21
Senior	0	21	99	24	96	0	30	24	66	36	66	18
Total	9	84	378	99	357	15	147	102	222	168	243	60

Position A (D): Dualistic Thinking; Position B (M): Multiplistic Thinking; Position C (R): Relativistic Thinking

The results related to four sentence stems studied one by one. Firstly, we study students' perceptions related to sentence stem 1. Sentence stem 1 and its content are like this:

My job as a student is:

1. Accept the information given to me by the lecturer without question and to learn it. (D)
2. To accept that some responsibility rests on me for learning but I am not sure what is expected of me about what or how to learn. (M)
3. To accept what is given but to think about it critically, to check other sources for myself and to take responsibility for what and how I learn. (R)

Table 3 shows the types of sentence stem responses given by students. Figure 1 presents that most of the students (approximately %80 of all students) chose Position 'C' (Relativist). In the sentence stem 1, other positions ('A' and 'B') were much less chosen than the Position 'C'. When figure 1 is examined, it was seen that there is no difference among class levels in this sentence stem. This finding showed that students realise that their job as a student is to accept what is given but to think about it critically, to check other sources for themselves and to take responsibility for what and how they learn. Therefore, high percentages of Position C in the first and second year students show that they might have similar perceptions in the high school about the student's job.

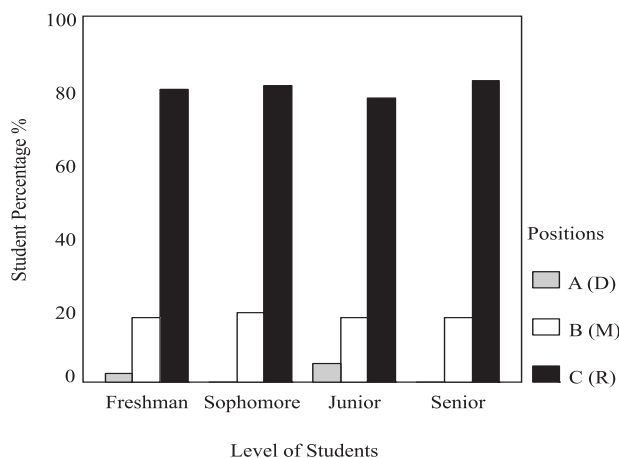


Figure 1. Distributions of percentage of students' responses to sentence stem 1.



Secondly, we study students' perceptions related to sentence stem 2. Sentence stem 2 and its content are like this:

I think that the lecturer's job is:

4. To give me all I need to know for the exams but where there is more than one way of looking at things the lecturer should indicate clearly which way s/he prefers. (M)
5. To provide me with information but I realise that the lecturer is not the only source of information and that I can find things out for myself to supplement what the lecturer has given. (R)
6. To give me all I need to know for the exams and to avoid any extra non-examinable material. (D)

Figure 2 presents that most of the students chose Position 'C' (Relativist) like Figure 1. Other positions ('A' and 'B') in the sentence stem 2 were chosen less according to Position 'C'. This finding showed that students comprehend that the lecturer's job is to provide them with information but they realise that the lecturer is not the only source of information and that they can find things out for themselves to supplement what the lecturer has given. Figure 2 also shows that there is a gradually increase through freshman to senior classes in the Position C. A few students, %3 of all students, chose Position A. However, Position B was chosen by %35 of freshmen and the percentages of Position B gradually decrease through senior year. These findings show that students are undergoing changes in perception, Position B to Position C, about the lecturer's job at university. Many students enter university with the impression that lecturer' job is to give them all their need to know for the exams but where there is more than one way of looking at things the lecturer should indicate clearly which way s/he prefers. The majority had changed this attitude through the senior years of the university.

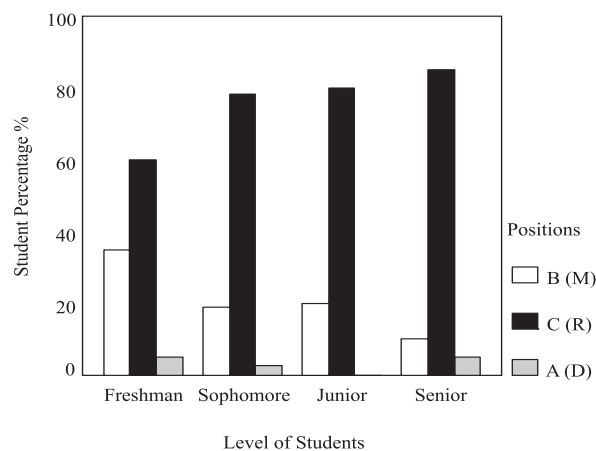


Figure 2. Distributions of percentage of students' response to sentence stem 2.

Thirdly, we study students' perceptions related to sentence stem 3. Sentence stem 3 and its content are like this:

I think that knowledge is:

7. A collection of unchangeable facts which are either right or wrong. I dislike uncertainties and vague statements. I am uncomfortable if I am asked to think for myself. I prefer to be given the facts. (D)



8. Complex and by no means all black and white but I find this exciting and stimulating. It makes me want to explore things for myself. (R)
9. Not just a collection of black and white facts but that there are shades of grey. Things may be right or wrong depending on circumstances and context. This uncertainty makes me feel uncomfortable. (M)

Figure 3 showed that there are similar results between freshman and sophomore students, and also junior and senior students. Freshman and sophomore students mostly chose Position A. On the other hand, most of the junior and senior students chose Position B. In general, the number of students who chose Position B was regularly increased but who chose Position A was decrease through freshman to senior classes. Position C was chosen lesser than the other Positions in this sentence stem. Many students enter the university with the perception of knowledge that a collection of unchangeable facts which are either right or wrong. However, students' perception of knowledge is changing to the point that knowledge is not just a collection of black and white facts but there are shades of grey. This uncertainty makes them feel uncomfortable.

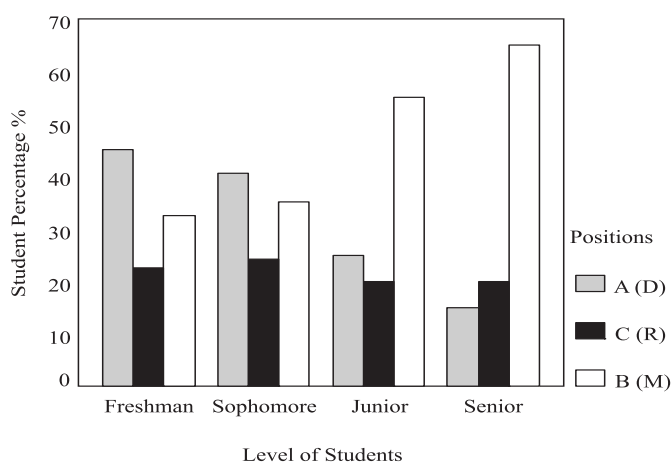


Figure 3. Distributions of percentage of students' response to sentence stem 3.

Lastly, we study students' perceptions related to sentence stem 4. Sentence stem 4 and its content are like this:

My job in my exam (assessments and exams) is:

10. To give back the facts I have learned as accurately as possible. I prefer questions with single clear-cut answers rather than open long questions. (D)
11. To answer the questions, including what I have been taught and what I have found out for myself from reading or other sources. I dislike questions which force me into a fixed answer (such as multiple choice) and prefer open questions in which I have room to show my own thinking. (R)
12. To give back all I know about the topic and leave the examiner to give me credit for the relevant bits. I quite like open-ended questions, which allow me to show how much I know. (M)



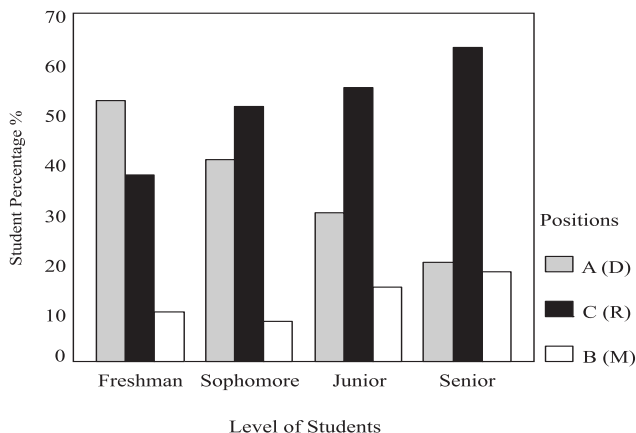


Figure 4. Distributions of percentage of students' response to sentence stem 4.

Figure 4 presents that most of the students chose Position 'C' (Relativist). Other positions ('A' and 'B') in the sentence stem 4 were chosen less according to Position 'C'. Position B was much less chosen than the other two Positions. The number of students who chose Position C was regularly increased but who chose Position A was decrease through freshman to senior years. In other words, many students graduate with the impression that they dislike questions which force them into a fixed answer (such as multiple choice) and prefer open questions in which they have room to show their own thinking. The reason of students prefer questions with clear-cut answers rather than open long questions in first year may be they exposed to lots of multiple choice exam during the secondary and high school years. For example, they have to pass the University Entrance Exam, which is also a multiple choice exam, to enter any university in Turkish Education System. Namely, the students are undergoing changes in perceptions about their job in exams while at university.

Discussion and Implications

In this study, a version of Perry's developmental model (Finster, 1991) has been used to investigate students' attitudes to learning made by science students from three departments (Department of Chemistry, Department of Physics, and Department of Biology) at Ataturk University. In addition, this study was aimed to expose whether there are changes in students' attitudes through freshman to senior years.

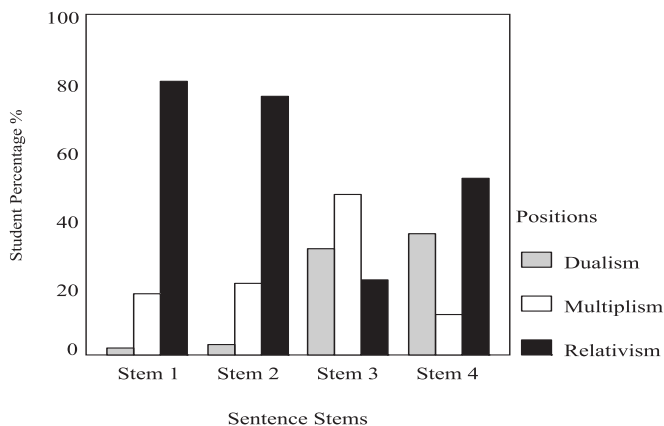


Figure 5. The percentages of all participants' choices for the four sentence stems.



The obtained findings showed that students are undergoing changes in attitudes to learning, teaching, and knowing while at university. Many students enter university with the impression that knowledge is a collection of unchangeable facts which are either right or wrong, and that lecturers are authority figures who know everything on their subject. The majority of students had changed these impressions through junior and senior years. Students start to take responsibility for their own learning as they progress at university rather than expecting that all the information is provided by the lecturer. This would include undertaking more individual study and collaboration with other students. As students become more responsible for their learning, they become more active in attempting to relate new information to topics or subjects on their course. With these changing perceptions of the subject areas and the role of themselves and the lecturer within the learning environment, students' preferences for their teaching, assessment and study methods also change.

Perry's scheme of intellectual development is useful in describing the behaviours of students and also in suggesting ideas for encouraging and supporting students to develop more relativistic thinking. For instance, to help a dualistic student (Position A) move to multiplistic thinking (Position B), one must challenge to bipolar nature of dualistic thinking by presenting multiplistic perspectives of an issue and letting them reconcile the inadequacy of the dualistic position. Helping students wrestle with the inadequacy of their arguments provides the necessary support to assist them to meet the challenge of change (Finster, 1991).

A transition from high school to university requires making a rapid adjustment in student's life and in his/her approach to learning and his/her first year at the university is hence a critical period (Hale & Tattersall, 1964). Widick (1977) have described how students' intellectual and identity development can occur in parallel at university and that the university environment should provide suitable challenges which facilitate this process. The Perry Scheme offers a framework in which teachers can understand how students make meaning of their world (Finster, 1991). Perry's Development Model relates assumptions about knowledge and the presumed roles of teachers and students. Understanding these often-hidden assumptions allows teachers to create a better environment for promoting learning of the student. Therefore, the Perry Scheme can be a guide for the development of teaching methods. Knowing the variations in development that shape students' responses is useful to teachers. It helps to bring order out of what often appears to be a puzzling diversity of response while relieving the teacher of the necessity of being all things to every student and enabling a more satisfactory response to individual needs.

Teachers should not be telling students what they ought to do. Encouraging development really means helping the students to find out their capabilities for themselves. A primary aim of higher education ought to be the imparting of the necessary critical skills of analysis and evaluation to enable students to develop a personal position based on the available evidence. If students can be helped to make a commitment then a real value will be given in return for the resources society is prepared to devote to higher education.

References

- Baxter-Magolda, M. B. (1987). Comparing open-ended interviews and standardized measures of intellectual development. *Journal of College Student Personnel*, 28, 443-448.
- Dawson, T. (2004). Assessing intellectual development: Three approaches, one sequence. *Journal of adult Development*, 11, 2, 71-85.
- Finster, D. C. (1989). Developmental instruction Part 1. Perry's Model of Intellectual Development, *Journal of Chemical Education*, 66, 659-661.
- Finster, D. C. (1991). Developmental instruction Part 2. Application of the Perry Model to general chemistry, *Journal of Chemical Education*, 68, 752-756.
- Hale, E. & Tattersall, A. (1964). *University teaching methods: A repeat of the committee on university teaching methods*. Her Majesty's Stationary Office, London.



- Hettich, P. (1988). Epistemological approaches to cognitive development in college students. In P. Sutherland (ed.), *Adult Learning: A Reader*, Kogen Page, London.
- 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.
- Katung, M., Johnstone, A. H. & Downie, J. R. (1999). Monitoring Attitude Change in Students to Teaching and Learning in A University Setting: A Study Using Perry's Developmental Model, *Teaching in Higher Education*, 4, 43-59.
- King, P. M. & Kitchener, K. S. (1994). *Developing reflective judgment understanding and promoting intellectual growth and critical thinking in adolescents and adults*. San Francisco: Jossey-Bass.
- Mackenzie, A. M., Johnstone, A. H. & Brown, R. I. (2003). Learning from problem based learning, *University Chemistry Education*, 7, 13-26.
- Marra, R. & Palmer, B. (2004). Encouraging intellectual growth: Senior college student profile. *Journal of Adult Development*, 11(2), 111-122.
- Moore, W. (1989). The Learning Environment Preferences: Exploring the Construct Validity of an Objective Measure of the Perry Scheme. *Journal of College Student Development*, 30, 504-514.
- Moore, W. (1990). *Cumulative bibliography and photocopy service catalogue for the Perry Scheme of intellectual and ethical development*, S.W. Olimpia, WA, Perry Network.
- Perry, W. G. (1970). *Forms of Intellectual and Ethical Development in the College Years: A Scheme*, Holt, Rinehart & Winston, New York.
- Salner, M. (1986). Adult cognitive and epistemological development in systems education, *Systems Research*, 3 (4), 225-232.
- Widick, C. (1977). The Perry Scheme: A Foundation for Developmental Practice. *Counseling Psychologist*. 6, 4, 35-38

Резюме

ВОСПРИЯТИЕ ТУРЕЦКИМИ СТУДЕНТАМИ СТАРШЕГО КУРСА ФАКТОРОВ, ВЛИЯЮЩИХ НА ПРОЦЕСС ИХ ИЗУЧЕНИЯ

Эрдал Сеноцак, Цезми Унал

В этом исследовании приняли участие студенты младших и старших курсов, обучающиеся по программе естествознания (физика, химия и биология). Главный вопрос – как студенты понимают свою роль и роль преподавателя. Была исследована природа знания, и задачи студента на экзамене. Версия Перри Модэля, разработанная Финстером применялась в этом исследовании. Эта модель показывает, как студенты развиваются от упрощенной позиции по природе знания к той, которая является более плюралистической и контекстуальной. Цель этого исследования состояла в том, чтобы исследовать интеллектуальное развитие студентов университета и сделать сравнение среди уровней класса согласно Перри Модэлю.

Выборка составлена из 471 студента, которые обучались на факультете образования по разным программам естествознания (физики, химии и биологии). Исследование проведено во время первого семестра 2003/2004 учебного года. Участие приняли студенты всех курсов – от первого до четвертого (последнего). Инструмент исследования, разработанный Финстером, применялся в данном исследовании. Было получено разрешение автора использовать его инструмент в исследовании. Анкета была переведена на турецкий язык. Перед основным исследованием было проведено пилотажное исследование для установления надежности инструмента.

Описательная техника анализа использовалась, чтобы объяснить полученные результаты. Полученные данные показали, что студенты подвергаются изменениям в отношениях к изучению, обучению, и знанию. Много студентов приходят в университет со впечатлением, что знание является собранием неизменных фактов, которые являются или правильными или неправильными, и что преподаватели являются фигурами власти, которые знает все. У большинства студентов эти впечатления изменились в течение процесса обучения. Студенты начинают брать ответственность за их собственное изучение, поскольку они прогрессируют в университете вместо того, чтобы ожидать, что вся информация обеспечивается преподавателем. Поскольку студенты становятся более ответственными за собственное изучение, они становятся более активными в попытке связать новую информацию с темами или предметами, которые они изучали раньше. Преподаватели не должны говорить студентам, что они должны сделать. Ободрительное развитие действительно означает помогать студентам узнавать



их способности. Первичной целью высшего образования должна быть передача необходимых критических навыков анализа и оценки, чтобы позволить студентам выяснить личную позицию. Схема Перри интеллектуального развития полезна в описании поведений студентов и также в предложении идей для того, чтобы поощрить и поддерживать студентов в развитии более релятивистического мышления.

Ключевые слова: Перри модель, интеллектуальное развитие, процесс изучения, восприятия студентов.

Received 07 November 2005; accepted 10 March 2006

Erdal Senocak

Assistant Professor,
Gaziosmapasa University, Education Faculty,
Department of Elementary Education, Turkey
Phone: +90 356 2521616
E-mail: e_senocak_2000@yahoo.com

Cezmi Unal

Research Assistant,
Gaziosmapasa University, Education Faculty,
Department of Elementary Education, Turkey
Phone: +90 356 2521616
E-mail: cezmiunal@yahoo.com

