STUDENTS' PERCEPTION OF SCIENCE CLASSROOM LEARNING ENVIRONMENT IN JAMMU, INDIA: ATTITUDES AND GENDER DIFFERENCES

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For the first time in Jammu, India, multiple research methods from different paradigms were used in this interpretive study to explore the nature of classroom environments. A sample of 1,021 students from 32 science classes in seven co-educational private schools completed the questionnaire on What is Happening in This Class (WIHIC) and an attitude scale. Data analyses supported the validity and reliability of the instrument when used in this context. Significant positive associations between the WIHIC scales and student attitudes were found and supported the predictive validity of the WIHIC. The multiple regression showed that, three scales namely, Investigation, Task Orientation and Equity were positively and significantly related to students' attitudes. Perceptions of the science classroom learning environment of male and female students in the same class were also investigated. The quantitative data provided a starting point from which other qualitative methods (interviews and observations) were used to gain a more in-depth understanding of the classroom environments with special reference to students' attitudes and gender differences there. An educational critique has been used to describe the social, cultural, economical and political factors that may be responsible for the present prevailing learning environments. The findings from the quantitative data were supported by the findings of interviews and observations.

INTRODUCTION

The notion that a learning environment exists which mediates aspects of educational development began as early as 1936 when Lewin (1936) recognised that the environment and the personality of the individual were powerful determinants of behaviour and introduced the formula, B=f(P,E). Since Lewin's time, international research efforts involving the conceptualisation, assessment, and investigation of perceptions of aspects of the classroom environment have firmly established classroom environments as a thriving field of study (Fraser, 1994, 1998, Fraser & Walberg, 1991). For example, recent classroom environment research has focused on constructivist classroom environments (Taylor, Fraser, & Fisher, 1997), cross-national constructivist classroom environments (Aldridge & Fraser, 1999; Fisher, Rickards, Goh, &Wong, 1997), science laboratory classroom environments (McRobbie & Fraser, 1993a), computer laboratory classroom environment (Newby & Fisher, 1997) computer-assisted instruction classrooms (Stolarchuk & Fisher, 1999; Teh & Fraser, 1995) and classroom environment and teachers' cultural back grounds (Khine & Fisher, 2001).

Despite the fact that a great deal of classroom learning environment research has been carried out over the past 30 years, most of the work was conducted in western cultures in early years (Fraser, 1994, 1998; Fraser & Walberg, 1991; Wubbels & Levy, 1993). However, classroom environment research has gathered momentum in Asian countries in recent years (Aldridge & Fraser 1999, Khine & Fisher, 2001, Riah & Fraser, 1998; Wong & Fraser, 1994). Evidence from these studies revealed that classroom learning environment dimensions are good indicators of teaching and learning process and their predictive power on a number of learning outcomes points towards the possibility of improving students' outcomes through changing classroom environments.

It is well-documented in reviews of literature that women are under-represented in science and technology courses and careers (Greenfield, 1996; Kahle & Meece, 1994) and the boys outperformed girls in science (especially physical science) (Bellar & Gafini,1996; Kahle & Meece, 1994; Murphy, 1996). Among the sources that may cause these differences are individual, cognitive, attitudinal, socio-cultural, home and family, and educational variables (Farenga & Joyce, 1997; Kahle & Meece, 1994). In the classroom context, boys and girls may not have equal opportunities in science activities, and this could cause gender differences in science achievement (Fraser, Tobin, & Khale, 1992; Harding, 1996; Warrington & Younger, 1996). Because educational variables are one of the important sources for accounting for gender differences in students' achievement in science, and for participation in science activities, the perspective of gender differences needs to be understood.

The present interpretive study went beyond past research and involved a multi-method approach. This study explored factors associated with students' perceptions of learning environment. Furthermore, by drawing on a range of paradigms, a more in-depth understanding of socio-cultural and political influences on the classroom leaning environments in India was explored.

DEVELOPMENT AND VALIDATION OF THE QUESTIONNAIRE

'What Is Happening In This Class?' (WIHIC)

The WIHIC questionnaire brings parsimony to the field of learning environment by combining modified versions of the most salient scales from a wide range of existing questionnaires with additional scales that accommodate contemporary educational concerns (e.g., equity and cooperation, Fraser, (1998). Based on the previous studies, Fraser, Fisher, and Mc Robbie (1996) developed this new learning environment instrument. The What is Happening In This Class? (WIHIC) consists of 7 scales and 56 items (Fraser, Fisher, & Mc Robbie, 1996) The seven scales are Student Cohesiveness, Teacher Support, Involvement, Investigation, Task Orientation, Cooperation and Equity. Table 1 shows the scales in the WIHIC, along with a brief description and a sample item from each scale in the questionnaire.

Table 1
Scale Description for each Scale and Example of Items in the What Is Happening In This Class? (WIHIC) Questionnaire

Scale	Description	Item
Student Cohesiveness [SC]	Extent to which students know, help and are supportive of one another.	I make friendship among students in this class
Teacher Support [TS]	Extent to which teacher helps, befriends, trusts, and shows interest in students.	The teacher takes a personal interest in me.
Involvement [IV]	Extents to which students have attentive interest, participate in discussions, perform additional work and enjoy the class.	I discuss ideas in class.
Investigation [IN]	Extent to which there is emphasis on the skills and their use in problem solving investigation.	I am asked to think about the evidence for statements.
Task Orientation [TO]	Extent to which it is important to complete activities planned and to stay on the subject matter.	Getting a certain amount of work done is important.
Cooperation [CO]	Extent to which students cooperate rather than compete with one another on learning tasks.	I cooperate with other students when doing assignment work.
Equity [EQ]	Extent to which the teacher treats students equally.	The teacher gives as much attention to my questions as to other students'.

The WIHIC questionnaire has been used to measure the psychosocial aspects of the classroom learning environment in various contexts since its development. In certain cases, the

questionnaire has been adapted without any modifications, while as in other cases modifications were made to suit the specific context. Currently, the original questionnaire in English has been translated into Chinese for use in Taiwan (Aldridge & Fraser, 1997) and Singapore (Chionh & Fraser, 1998) and Korean for use in Korea (Kim, Fisher, & Fraser, 2000).

In a study on associations between learning environments in mathematics classrooms and students' attitudes, using the WIHIC questionnaire (Rawnsley & Fisher, 1998), it was found that students developed more positive attitudes towards their mathematics in classes where the teacher was perceived to be highly supportive, equitable, and where the teacher involved students in investigations.

Associations between actual classroom environment and outcomes were investigated using actual and preferred forms of the WIHIC (Chionh & Fraser, 1998). The associations between examination results, self-esteem and attitude scale and seven classroom environment scales were investigated in geography and mathematics classrooms in Singapore and Australia. It was found that better examination scores were achieved where students perceived the environment as more cohesive. Self-esteem and attitudes were more favourable in classrooms perceived as having more teacher support, task orientation and equity.

Hunus and Fraser (1997) used a modified version of the WIHIC in Brunei, and reported on the associations between perceptions of learning environment and attitudinal outcomes. Simple and multiple correlations showed that there was a significant relationship between the set of environment scales and students' attitudes towards chemistry theory classes. The Student Cohesiveness, Teacher Support, Involvement, and Task Orientation scales were positively associated with the students' attitudes.

Khoo and Fraser (1997) used a modified version of the WIHIC to measure classroom environment when evaluating adult computer

courses. The Cooperation scale was dropped in this modified version and Student Cohesiveness and Teacher Support were collapsed into one scale named Trainer Support. A set of 38 items was retained after factor analyses. This study indicated that the males perceived greater Involvement, while females perceived more Equity. The other striking result of the study was that older females had a more positive perception of Trainer Support than the younger ones.

Fraser and Aldridge (1999) used English and Chinese versions of the WIHIC in Australia and Taiwan, respectively, to explore the potential of cross-cultural studies. Results of the study indicated that students in Australia consistently perceived their classroom environment more positively than students in Taiwan. Significant differences were detected on the WIHIC scales of Involvement, Investigation, Task Orientation, Cooperation and Equity. This indicated that students in Australia perceived they are given more opportunity to get involved in the experiments and investigate scientific phenomena. In this study, cultural differences were highlighted. Education in Taiwan is examination based and teaching styles are adopted to suit the particular situation. In Taiwan, having good content knowledge of the subject was the yardstick for being a good teacher, while as in Australia having good interpersonal relationships between students and teachers is considered the most important factor in education process. Taiwan classrooms are teacher centred giving very little opportunity to students to discuss issues.

Khine and Fisher (2001) used the WIHIC in Brunei to study the classroom environment and teachers' cultural background in an Asian context. The study found that teachers from different cultural backgrounds created different types of learning environments. It also indicated that the WIHIC is a useful instrument with which to measure the cultural background differences and can be used as a basis for identification and development of desirable teacher

behaviours that will lead to a conducive learning environment.

The above studies support the validity and reliability of WIHIC in portraying the nature of science classroom environments. These studies also have consistently demonstrated that the WIHIC can be used to gather information from students for improving teaching and learning in different classroom contexts. Thus, with such a wide use and applicability of the WIHIC, its applicability was validated in India to get an insight into its use as well as insight into the Indian classroom learning environment.

METHODOLOGY

The aims of the study were to:

- provide further validation information about the WIHIC (in terms of reliability, factor structure, ability to differentiate between classrooms, etc.) when used with an Indian sample;
- investigate associations between students' perceptions of the classroom learning environment in India and students' attitudes to science;
- investigate differences in the perceptions of male and female students about their science classrooms in India; and
- conduct observations and in-depth interviews with students to obtain a deeper understanding of science classroom learning environments in India.

This study was carried out in the city of Jammu, India. The sample consisted of 1,021 students from classes 9 and 10 who completed the WIHIC and an already existing attitude scale measure students' attitudes towards their science classrooms. The scale comprises eight items measuring the extent to which students enjoy, are interested in and look forward to science lessons. The attitude scale is based on the *Test of Science Related Attitudes* (TOSRA), developed by Fraser earlier. The students involved in this study

were from seven different co-educational private schools. The total number of classes covered was 31 and the average class consisted of 27 students. The qualitative component involved a sub-sample of two students from each class. Sixty-two students were interviewed and furthermore each class was observed for a period of two lessons of half an hour each.

RESULTS

Reliability and Validity of the WIHIC

In the statistical analyses the internal consistency (Cronbach alpha reliability), discriminant validity (mean correlation of a scale with the other six scales of the instrument) and an ANOVA to determine the ability of the WIHIC to distinguish between classrooms were used. The results are reported in Table 2.

The reliability coefficients for different WIHIC scales ranged from 0.58 to 0.83. The highest alpha reliability (0.83) was obtained for the Equity scale and the lowest (0.58) for the scale Student Cohesiveness. The results being consistently above 0.50 suggests that the WIHIC can be considered to be a reliable tool (de Vellis, 1991) for use with Indian students. The mean correlations of one scale with the other scales ranged from 0.38 to 0.47. These values can be regarded as small enough to suggest that each scale of the WIHIC has adequate discriminant validity, even though the scales assess slightly overlapping aspects of classroom environment. In keeping with traditional learning environment research, the eta^2 statistic was calculated to provide an indication of the degree to which each scale could differentiate between the perceptions of students in different classes. The eta^2 statistic, which is the ratio of 'between' to 'total' sums of squares and represents the proportion of variance in scale scores accounted for by class membership. It ranged from 0.09 to 0.14 and was statistically significant for each scale. This indicates that each scale of the WIHIC is capable of

differentiating significantly between classes (p,0.001). Overall the reliability, discriminant validity and ANOVA results confirmed that the WIHIC could be used with confidence for further research.

Table 2
Scale Internal Consistency (Cronbach Alpha Reliability), Discriminant Validity (Mean Correlation with other Scales) and Ability to Differentiate Between Classrooms (ANOVA results) for the WIHIC

Scale	Alpha Reliability	Discriminant Validity	Anova *Eta*^{2}
Student Cohesiveness	0.58	0.38	0.10*
Teacher Support	0.78	0.42	0.14*
Involvement	0.76	0.47	0.14*
Investigation	0.77	0.40	0.10*
Task Orientation	0.70	0.39	0.12*
Cooperation	0.77	0.42	0.09*
Equity	0.83	0.43	0.14*

*p<0.001 n=1,021 students in 31 classes

Student Perceptions of their Learning Environments

Table 3
Mean and Standard Deviation for Each WIHIC Scale

WIHIC Scales	Mean	Standard Deviation
Student Cohesiveness	4.77	0.54
Teacher Support	4.00	0.87
Involvement	3.89	0.79
Investigation	3.89	0.83
Task Orientation	4.84	0.63
Cooperation	4.49	0.77
Equity	4.57	0.89

The very high mean scores shown in Table 3 suggest a very positive classroom environment, with the mean scores ranging between 3.89 and 4.84. The students perceived Task Orientation, Student Support and Cooperation most positively. The scores for these three scales are 4.84 for Task Orientation, 4.77 for Student Cohesiveness and 4.49 for Cooperation. The standard deviation for all the scales is less than 1, suggesting that there was not large diversity in the students' perceptions. Generally, the students perceive a very positive science classroom learning environment in India.

Associations between learning environment and attitudinal measures

Associations between science classroom environments as measured by the WIHIC scales and students attitude towards scientific inquiry were explored by simple and multiple correlation analyses. As shown in Table 4, the results of the simple correlation analysis revealed that all the seven scales were significantly correlated with attitude to science classroom environment ($p<0.01$). It was found that these associations were positive ranging from 0.17 to 0.38.

The multiple correlation, R, was 0.43 and is statistically significant ($p<0.01$). This strongly supports the conclusion that the nature of the classroom environment is strongly influencing students' attitudes towards science lessons. In order to interpret this relationship, the standardised regression coefficient (b) was also examined. It was found that out of seven scales, three scales retained their significance ($p<0.01$). This means that the scales Investigation, Task Orientation and Equity are independent predictors of individual students' attitude towards science lessons. The R^2 value, which indicates the proportion of variance in attitude towards science lessons that can be attributed to students' perception of classroom environments was 19%.

Table 4
Associations between WIHIC Scales and Attitudes Towards Science Lessons in Terms of Simple Correlations (r), Multiple Correlation (R) and Standardised Regression Coefficient (b)

Scale		Attitude to Science	
		r	β
Student Cohesiveness		0.17*	-0.03
Teacher Support		0.23*	0.04
Involvement		0.24*	0.01
Investigation		0.27*	0.1*
Task Orientation		0.38*	0.27*
Cooperation		0.23*	0.00
Equity		0.32*	0.15*
Multiple Correlation	R	0.43*	
	R^2	0.19	

*p <0.01 n=1,021

Perception of Classroom Learning Environments: Gender Differences

Means were computed for male and female students in the same class separately. This was followed by a repeated-measure ANOVA with sex as an independent variable. In order to investigate which of the WIHIC scales gave rise to this significant difference, a paired t-test was conducted for each WIHIC scale. It was found that there were significant statistical differences in the scales for Cohesiveness, Task Orientation, Cooperation and Equity. The magnitude of these sex differences are relatively large in favour of female students. These results suggest that the girls on the whole had more positive perceptions of their science classes than did boys. Girls seem to perceive their science teacher as more cohesive, task oriented,

cooperative and giving them equal opportunity in the class. On the other hand, the boys perceived for more of teacher support, involvement and investigation activities in the science classroom.

Table 5
Female and male Students' perceptions of Classroom Learning Environment using WIHIC and Within –Class Gender Subgroup Mean as unit of Analysis

Scale	Gender	Mean	Std. Deviation	t-value
Student Cohessiveness	Female	4.20	0.48	2.38*
	Male	4.13	0.45	
Teacher Support	Female	3.48	0.77	-0.83
	Male	3.52	0.75	
Involvement	Female	3.37	0.69	-1.6
	Male	3.44	0.69	
Investigation	Female	3.38	0.77	-1.98
	Male	3.47	0.66	
Task Orientation	Female	4.31	0.50	5.00**
	Male	4.13	0.59	
Co-operation	Female	4.00	0.65	3.92**
	Male	3.83	0.69	
Equity	Female	4.11	0.67	5.25**
	Male	3.85	0.68	

Female n=581 * $p<0.05$, ** $p<0.01$
Male n=440

Qualitative Data

The results of the large-scale quantitative probe led the researcher to generate qualitative data to provide more insight into the students' perceptions. The students' anecdotal comments obtained from the interviews were generally consistent with their perceptions of their classroom learning environments as indicated by the WIHIC adding to the validity of the instrument for measuring students'

perceptions of classroom learning environment. From the student interviews, which were based on items of the WIHIC, the researcher felt that understanding of socio-cultural factors and the educational system was important. The researcher has tried to give a glimpse of the educational system along with socio-cultural and political scenarios in the form of a story (Clandinin & Connelly, 1994). This story is based on observations and interviews made over a number of occasions, to provide an authentic paradigm with which the reader can identify (Adler & Adler, 1994). Although all aspects of the story might not be present in any one classroom, none are uncommon in the classrooms observed. The story is followed by an interpretative commentary (Geelan, 1997) to help place it in context with science classrooms in India.

THROUGH THE RESEARCHERS' EYES

Observations

It was a cold chilly morning and I was scheduled to go and observe a Science Classroom. Due to the political disturbances, my work was running a little slow than scheduled and I was feeling a little low. A hot bath followed by a sumptuous breakfast (Indian hospitality) was enough to make me feel better. At about 8.45 am I left home along with my husband and driver. The three-kilometre drive to school was an experience, after a full week of forceful house arrest. Despite the fact that during the previous week, the city had been either under curfew imposed by the government or closed due to a call given by the militant or opposition parties, that day the roads were fully jammed with all sorts of traffic on them. My driver told me that Jammu city had the second heaviest traffic density in the world. Out on the road no one could imagine that the city had been literally paralysed for a week. Everything looked very normal and people were trying to make best use of whatever time they had for their business. This short drive simply should have taken me ten minutes but it took more than 45 minutes.

On reaching the school, despite the fact that I had already obtained consent from the principal of the school to come and observe a nominated classroom, I was not allowed entry into the school. My driver was asked to park the car away from the school gate because of the safety regulations. I had to fill in a prescribed form stating the purpose of the visit and whom I intended to meet in the school. This form had to be sent in through the school orderly. Till then I was asked to wait on the road outside the school. After about 20 minutes an orderly came and let me inside the school. It was a solid concrete three story building with a play ground at the back of the school. The entrance hall/foyer of the school was well furnished and there was hanging an eye catching nine feet by four feet poster which showed a burning candle in it and read *'TEACHER IS LIKE A CANDLE, IT BURNS ITSELF TO GIVE LIGHT TO ITS STUDENTS.'* The principal allocated a teacher to assist me. After the usual protocol, we headed towards the classroom, which was in first floor. On my way to the classroom, I saw students returning quietly from a morning assembly in neat straight queue. They were all wearing neatly ironed school uniforms.

By the time I reached the class, which I was going to observe, the teacher had already arrived. On my entry into the class, the teacher paused and all the students got up as a mark of respect and welcomed me. I thanked them and requested them to sit down. I tried not to disturb them and quietly went and sat on a chair at the back of the room. This was a well-ventilated classroom with nearly 50 students in it. The classroom was furnished with desks and benches, which were nearly two and a half feet in length and three students, shared each bench and desk. Big satchels hung at the back of their benches. Two fans were fixed to the ceiling but being a cold day they were not working, but I was told that even in summer months they would face power failures/cuts from time to time. Male and female students sat on the opposite sides of the classroom. The walls of the classroom were decorated with

educational charts, moral sayings and photographs of the national leaders. There was an elevated dais for the teacher, which was furnished with a chair and a table. The teacher faced the students most of the time with a black chalkboard at her back, the only permanent visual aid, which she used. From time to time, the teacher used charts or specimens, which had to be specifically issued by the school library on request.

The teacher started that day's lesson and, as indicated on the black board, she was going to teach 'Reflection by Spherical Mirrors'. There was "pin-drop" silence in the classroom. The lesson started with an introduction to light, which the students must have done in the previous year. The teacher then unfolded a chart showing the different positions and the nature of the image formed by a concave mirror. At the same time, the students had their textbooks opened and they were also referring to the book. While going through the lesson, the teacher also drew the figures on the black board. Later in the lesson, the teacher asked the students if they had any doubts about the content taught. The students raised their hands and the teacher answered each one of them one by one. While answering the queries of the students, the teacher also cross-examined them for their understanding by asking them more questions on the same topic. After this, the teacher wrote a few questions on the black board and the students were asked to answer them in their notebooks at home. Next day they would submit the homework to the teacher for correction. Only five minutes were left before the next class and two student representatives stood up. One started distributing the note books which the teacher had corrected and brought with her, while the other one started collecting note books from the students where the home work given on the previous day was done. The teacher assistant told me that these students had class tests every Monday on the topics taught in the previous week. The weekend was said to be the right time to learn

and then revise. The students have to get these answer books signed by their parents. Soon the school bell rang for the next lesson and all the students got up in respect of their teacher and farewell her collectively. I also left the classroom at the same time. This account is of a typical year 9, science classroom in India.

INTERVIEWS

Comments on findings from Interviews and Observations

The observations followed by interviews indicated that curriculum could be a major influence on the learning environment created in the country. The classrooms are teacher centred, where the students appear to have a very passive role. This was mostly due to the fact that the curriculum was of an examination-driven nature and teachers had to finish the prescribed course content in a given frame of time in order to produce results. For example while interviewing one student said in the interview:

> *I don't think our teacher has much choice. She is a good teacher, but she has to complete the whole course much before our exams. We should have enough time for revision also to produce good results. Good result is the litmus test for all of us the school, the teacher and of course we students.*

On top of this, the socio-political instability in the country / city is making it extremely difficult to finish all the course content and the teacher has to press students hard to achieve this. Students also have to produce good results, as competition is very tough for entry into the university courses they want. For example:

> *Um, it is sort of very stressful for us. We really don't know when we won't be having school. So many disturbances going on. If we don't have school for three days teacher tries to cover up for it and we have lot to learn and home work too. If we don't do so we won't get good marks in the final exams and finally we cannot get admission in any good course and we won't be respected.*

The social fabric of the society is such that only a student who gets a high score in the examination is accepted by his peers in specific, and respected by the society in general. Keeping all these factors in mind, the lecture method of the teacher is probably justified.

The practice of written homework and weekly tests are examples of rote learning. Students are supposed to revise the content learnt in the past one week only. Students when interviewed about this aspect, said that they could do well in weekly tests and then they had to go back to these topics only towards the end of the year when they would have final examinations where they had to go through whole of the course content. For example:

Yes, we do get lot of homework and we also have cycle tests on every Monday. This way we learn it well and then revise the whole course at the time of main exams. The homework and weekly tests keep us ready for the final exams and we can get good marks these test results keep our parents informed about our progress.

The major aim of students is to work towards getting good scores. The practice of getting test papers signed was to keep parents informed about their children.

Respect for the teacher is reflected through the practices and values given to students through the school. Students get up and greet their teacher on her/his entry or when leaving the classroom. Students never question the teacher's knowledge. For example:

> *Our teacher is like God to us. She works for our good and it is our duty to respect her. She does scold us sometime, when we fail to behave or not do the school work properly. We don't mind it. She is doing it for our good. Next time we are careful.*

While clearing the doubts of students, the teacher would cross-question the students and they did not object to this. Keeping all these factors in view, it seems the teacher enjoyed an ultimate unquestionable authority position in the classroom.

The interviews and observations indicated that education is focused predominantly on the development of academic ability of students. The environment conveys the message that teacher is finishing himself/herself off and giving gift of knowledge to the students. In short, we may say that the learning environment created by educational, social and cultural influences is favourable for the students living in India.

CONCLUSIONS

Science can be viewed as a cultural artifact and it is embedded in and is influenced by society and culture (Fisher & Waldrip, 1999). Many research studies have been carried out in education concerning cultural diversity in the classroom (Atwater,1994; Cobern & Aikenhead,1998), but very there is no evidence of any such study carried out in India.

Aldridge, Fraser, and Haung (1999) while carrying out a study on classroom environments in Taiwan and Australia, found that education in Taiwan focused predominantly on academic ability of the students and social and emotional development were considered to be the responsibility of the family. But in Australia, teachers

considered academic advancement as one of the aspects to be developed in students among many more. In most of the Asian countries, education systems are examination oriented and the teacher follows a fixed syllabus.

This study investigated the nature of classroom environments in Jammu (India). The classroom-learning environment was found closely matching to the environment reported by other studies carried out in other parts of Asia. Data analyses support the validity and reliability of the WIHIC when used in India in this context. Being one of the earliest study of its nature in this part of world, an in-depth view of the learning environments there is gained.

The ultimate aim of education is to produce healthy minded productive citizens. This can be achieved through positive attitudes towards learning by creating an enjoyable and productive learning environment. The existing learning environment can be re-inforced by incorporating more positive practices which will give an atmosphere of "thriving" to students and teachers specifically and ultimately leading us all towards a much healthier society. Studies of such a nature, as this one enable researchers, teachers, and teacher educators to gain better understanding of their own beliefs and social and cultural restraints in their teaching.

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