

## **Teacher Training Programs: Toward implementing a Naturalist Approach**

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### **Abstract**

This study aims to explore how the naturalist approach can be used to improve learning. 60 novice teachers were encouraged to provide a question on a topic in education that interested them. The data analysis was based on a qualitative methodology using ATLAS.ti 5.0. The findings indicated that most of the questions could be accounted for by a model that included the following four dimensions: 'student discipline', 'student achievements', 'student well-being' and 'relationship with parents'. The findings suggest that teacher training programs should consider using the naturalist approach as an integral part of their curriculum to promote meaningful learning.

**Keywords:** effective learning; learner-centered education; naturalist approach, schools; teacher trainees

### **Introduction**

At one of the largest universities in Israel, one of the primary objectives of the education department's B.A. teacher training program is to give students general concepts on teaching and expose them to central educational theories. This objective is shared with comparable programs at other universities and colleges around the world (e.g., Nipissing University, Canada; University of Gloucestershire, UK; Boston College, USA; Charles Darwin University, Australia; Victoria University, New Zealand). Based on the 'naturalist approach', which argues that meaningful learning is based on asking questions about real-life experiences (Frank, 2006), this study tries to answer the following questions:

- (a) What are the educational issues that especially interest novice teachers in their first year of teaching?
- (b) Based on this information, can we determine which central topics need to be better addressed in teacher training programs?

These questions are based on the existing literature regarding the early stage in teachers' careers (e.g., Johnson et al., 2004; Lynn, 2002; McCormack, Gore & Thomas, 2006). At the beginning of their careers, young teachers are often enthusiastic, yet at the same time may find themselves thrown into demanding and overwhelming social contexts, teaching children who sometimes come from low socio-economic status homes, where conditions of violence may reign, and material resources are limited (Hargreaves, 2005). At this early point in their careers, the new teachers are sensitive to different educational processes, and still trying to orient themselves as professionals by asking questions about the educational system, in order to reduce their insecurity in school. Their fresh perspective may allow them to ask original, insightful questions about such subjects as school organization and methods of teaching.

Further support for this study's interest in novice teachers' questions may be found in previous studies (Friedman & Kass, 2002; Knobloch & Whittington, 2002; Richardson & Placier, 2001) which established that the perceptions of first-year novice teachers are similar to those of B.A. students. Given that the materials of the B.A. program are still fresh in their minds, they may help us to understand how to improve learning in B.A. programs.

### **Theoretical background**

#### ***The learning-based naturalist approach***

The problem with general B.A. programs seems to be that the courses try to cover too many principles, resulting in very little retention (Hansen, Salemi, & Siegfried, 2002). Frank (2006) described a successful economic learning experience using a simple pedagogical device which he termed the 'economic naturalist writing assignment': participants posed an interesting question about something they had personally observed and then used basic economic principles to answer it. This pedagogical approach is based on previous studies indicating that the narrative form facilitates information absorption by the brain (Doyle & Carter, 2003).

Frank's (2012) writing assignment takes its cue from this insight. It is an effective strategy for transforming students into 'economic naturalists'. Just as biology can inspire people to observe and marvel at details of the natural environment that would have otherwise escaped notice, economics can lead students to see the mundane details of or-

dinary existence in a new light. Frank (2002) compares learning the economic way of thinking to learning to speak a new language. Even the best students cannot acquire fluency in a second language without practicing it regularly. Learning to think in economic terms requires the same sort of practice. The economic naturalist approach is designed to force students to speak and write economics.

Frank's (2006) explanation detailed several reasons why the writing assignment is likely to be successful: (a) In order to think of an interesting question, participants must first try numerous preliminary questions. That in itself is an important exercise; (b) participants who raise interesting questions have more fun with the assignment and devote more energy to it; (c) participants who pose interesting questions are more likely to tell others about it, and as a result, internalize the exercise; and most importantly, (d) when participants struggle to explain an event according to core principles or a theoretical model that they have learned, the writing assignment facilitates a deeper understanding of the basic theoretical principles.

According to Frank and Bernanke (2003), the naturalist approach not only helps students master basic economic principles, but is also an extremely effective vehicle for testing whether they have in fact acquired an in-depth understanding of those principles.

### ***The learner-centered education***

Learner-centered education (LCE) as a concept is best studied phenomenologically, with sensitive attention to definitions and interpretations suggested by different contexts. However, for the purposes of this article, LCE will be defined as one end of a continuum of pedagogical practices. In contrast to lecturing derived from a fixed curriculum and rote learning, LCE '...gives learners, and demands from them, a relatively high level of active control over the contents and processes of learning. What is learnt, and how, are therefore shaped by learners' needs, capacities and interests' (Schweisfurth, 2013, p. 20).

This apparently simple definition has been expanded in different directions by theorists and policymakers. One such example is the *cognitive narrative*. Evidence from cognitive psychology supports the notion that learner control over the content and learning process helps learners build neural connections and meaningful patterns from existing knowledge, leading to more effective and sustainable learning (Ginnis, 2002). Learning something that is meaningful to the learner provides, in itself, an important motivation, that helps the learner focus and retain knowledge.

A second narrative, *emancipation*, describes the ways pedagogy can help students develop the knowledge, attitudes and behaviors that can contribute to transforming society (Freire, 1972). In this narrative, learner control is central, and becomes even more radical with the introduction of critical pedagogy, which allows learners not only to take more control over the process of learning, but also encourages them to challenge canons of received knowledge. A final narrative, *the preparation narrative*, has considerable relevance to educational policy. According to this narrative, inquiry-based learning helps develop such skills as flexibility and critical independent thought, which can help teachers creatively develop and consolidate an effective learning base regarding such educational policies as improving students' achievements (Colclough, 2012).

### ***The relationship between the learning-based naturalist approach and LCE***

Schweisfurth (2013, p. 146) proposed a set of minimum standards for LCE. The present study suggests that LCE can be enhanced by fusing Schweisfurth's proposed standards with the naturalist approach, in the following ways: (1) LCE proposes that engaging participants may motivate them to learn. The naturalist approach can help attain this goal, by asking participants to devise questions which interest them. (2) LCE proposes using dialogue in teaching and learning. The naturalist approach can be used here too, to invite participants to select a question of interest to them after having discussed it with other people. (3) LCE proposes exposing learners to tensions existing between global, national and local understandings of relevance, as they occur in real-life situations. Here too the naturalist approach can be of help, since by trying to find answers to questions, it can expose participants to real-world tensions between different factors. (4) LCE recommends basing the theory not on content alone, but also on skills and attitude outcomes. These may include critical and creative thinking skills. The naturalist approach can help realize this recommendation, since participants can develop critical and creative thinking skills as they ponder many different possible questions before settling on the one they choose to pursue.

### ***The Israeli educational context***

This section will describe Israeli schools and high education, allowing readers outside Israel to understand the context of the present study. The unique features of the Israeli context may prove to be relevant to assessing the findings and implications of the present study.

#### ***Israeli schools***

The Israeli educational system reflects the divisions of its different

constituent populations, including ethnically heterogeneous immigrants, and is divided into nonreligious public schools, religious public schools, and private schools (nonreligious and religious). After six years in elementary school, most Israeli students enter junior high school (grades 7-9), followed by high school (grades 10-12). Students finishing junior high schools can choose between the academic track, which prepares them for academic studies, and the vocational track, which usually caters to students who have not done well in junior high school. Both tracks prepare students for the matriculation examinations required for higher education; however, matriculation rates to higher education are much higher for students in the academic track (Ayalon & Shavit, 2004).

Israeli education is severely underfunded. Israeli expenditure for education per student, as measured by the purchasing power parity (PPP), is low compared to the OECD mean, resulting in classes that are larger and teachers that are paid less than in the OECD average (OECD, 2011). The latter factors may explain why Israeli teachers often complain that it is difficult for them to maintain an effective and orderly learning environment. In most Israeli schools, classes are typically very large and noisy, and the disciplinary sanctions that teachers can legally employ are limited (Almog, 2004). Thus, the difficulties inherent in the Israeli setting increase the importance of effective learning among the students in the teacher training programs.

### ***Teacher training programs in Israel***

Israeli universities and colleges grant a Bachelor's degree in education after the completion of 6 full academic semesters. Students who intend to become teachers must attain a minimum GPA of 75 and complete a 2-year training program which they may begin in the program's 3rd or 4th year. The teacher training program is comprised of courses and workshops such as 'educational psychology', 'teaching methods', 'evaluation and assessment', 'technology in the classroom', and 'practice teaching'. After completing the two-year training program, teacher trainees receive a teaching license for their discipline from the Israeli Ministry of Education and are then entitled to benefits and tenure.

## **Method**

### ***Participants***

The study included 60 novice teachers (50 women and 10 men) in their first year of teaching. They had all graduated a B.A. teacher training program at one of the largest universities in Israel, and their average age was 26.10 (SD = 3.45). All the participants had been hired through a temporary contract. 48 participants taught full-time and the rest taught part-time. These characteristics roughly represent those of

entirety of novice teachers in Israeli educational systems (Israel Central Bureau of Statistics, 2013).

All novice teachers specialized in a discipline of their choice (e.g., biology, mathematics, history, Bible studies, etc.), which they taught at different school levels (junior high school and high school) and in different sectors (religious/unreligious). Each teacher taught at a different school, varying according to the socio-economic levels of the students, from all seven districts of the Israeli Ministry of Education.

### ***Data collection***

The data were collected during 2013. Having received permission to perform the study from the university's institutional review board and the Israeli Ministry of education, we organized group information meetings with novice teachers who had finished their B.A. studies at one of the largest universities in Israel, and informed them that they would be asked to provide questions which would serve as the data for studying how to improve meaningful learning in B.A. education programs. The novice teachers' motivation to participate stemmed from a genuine concern for learning at the university, as well as a desire to improve the learning effectiveness for future teachers' generations.

The novice teachers were prompted to pose a question about any educational issue that especially interests them. They were asked to pose this question in an interview they were to conduct with teachers or principals chosen from schools in which they do not teach – this in order to reduce their potential bias through emotional involvement with interviewees from the same schools. All novice teachers had taken three courses in research methods and had already had experience in conducting field interviews.

Drawing on these interviews, the novice teachers were then requested to answer their own question in writing. Finally, they submitted a composite document consisting of their question, the transcribed interviews, and their answer. The novice teachers' writing, presented in this composite document, proved invaluable in several ways. *First*, the novice teachers' original perspective meant that their question revealed significant, often unnoticed features of educational practice at schools. Their insights could furthermore be directly related to the theoretical material taught in the B.A. program, which were still fresh in their minds. *Second*, the inclusion of both the interview transcriptions and the novice teachers' final answers, drawing on these interviews, allowed us to see the naturalist approach in action: it showed how a process of original thinking and tentative exploration through interviews can help reach new ideas. In section 4, below, excerpts from the

novice teachers' answers are followed by relevant segments from the interviews they conducted, allowing the reader a glimpse into the workings of the naturalist approach.

### ***Ethical considerations***

Ethical considerations regarding research procedures were made on the basis of guidelines taken from the Ethical Principles of Psychologists and Code of Conduct (2002). It is important to note that the researchers in this study did not teach in the program in which the novice teachers had studied, and the present study was conducted only after the novice teachers had already received their B.A. degree and teaching license, so there was no conflict of interest or dependence between the novice teachers and the researchers. Investigating novice teachers' perceptions helps us avoid the ethical difficulties that could arise in studies focusing on students in B.A. programs who may be pressured by their instructors, on whom they depend, to participate in the study.

The novice teachers and their interviewees participated on a voluntary basis, and were assured that their statements could not be traced back to them upon publication of the findings. The novice teachers and their interviewees received a formal letter describing the goals of the study, the pledge to preserve anonymity and confidentiality and their right to withdraw from the research at any time. Therefore, no ethical lapses were committed during the research for this study.

### ***Data analysis***

The data analysis followed a qualitative approach outlined by Strauss and Corbin (1998) and Charmaz (2000). The coding began with an analysis of the novice teachers' documents which included their questions, interviews and conclusions. The texts were analyzed in order to cluster the questions into categories. For example, from the answer to the question *'What is the purpose of school uniforms'* emerged the category of *'Student discipline'*. In some documents, several categories emerged simultaneously from the same question. Therefore, for each document, only the most salient category was considered for the purpose of clarity. Then, selective coding was implemented in order to relate the categories to a core category (Moghaddam, 2006). In this study, the core category was *'learner-centred education through the naturalist approach'*, and four dominant categories of learning aspects were found to be related to this central concept: *'student discipline'*, *'student achievements'*, *'student well-being'* and *'relationship with parents'*.

To ensure accuracy of analysis, the data were organized using the ATLAS.ti 5.0 software package that assists in qualitative analysis of

textual data (Muhr, 2004). This software helps to methodically organize and document themes within data, enabling the user to retrieve text passages from one or more text documents (Crego, Alcover de la Hera, & Martinez-Inigo, 2008).

Two steps were taken to establish the trustworthiness of the data collection and analysis procedures. First, the data were analyzed by the author and by a research assistant who has had extensive training in qualitative analysis. Second, the author and the research assistant cross-checked the results using independently-coded data, and then held a meeting to discuss preliminary findings to ensure the consistency of the analysis (Boardman & Woodruff, 2004).

### **Findings**

The findings showed that several topics which novice teachers found interesting were not part of the B.A. program curriculum, including student achievements in international assessments, the role of school uniform and psycho-didactic evaluations. Other topics, such as parent involvement versus parent intervention, student discipline and student well-being, appeared only implicitly in the B.A. program curriculum.

The next few sections describe in greater detail the questions that interested participants and the learning dimensions which those questions probed.

### ***Student discipline***

The issue of student discipline appeared in a large number of questions. For example, the question, *'What is the goal of school uniforms'* dealt with an important element in *'student discipline'*. One novice teacher argued:

'During the 90s, there was a paradigm shift towards putting the individual in centre. One such way was by giving students the opportunity to express themselves by wearing whatever clothes they chose. The Ministry of Education decided to go along with this approach and cancelled mandatory school uniforms. However, certain issues arose: First, in large schools, teenagers who did not belong to the school came during school breaks and caused problems since it was difficult to recognize who belonged to the school. Second, an awareness of the importance of promoting equality among students, as reflected by clothes, developed. These factors caused the Ministry of Education to reverse their decision. In 2011, school uniforms became obligatory again in both elementary and junior high schools. Regarding high schools, it depends on the individual school policy' (female, 23 years old, teaching biology at a public religious high school).

Following are excerpts from interviews conducted by the novice teacher with a high school principal and history teacher, which she cited in her answer:

Principal: 'I'm in favour of school uniforms. First, in a big school like mine you know who belongs to your school. It promotes school discipline and helps keep the school a dignified place with rules. It also helps blur the economic gaps between students' (female, 50 years old, working at a secular public high school).

Teacher: 'School uniforms help. Students don't come with unacceptable clothes. It helps create order, without having a fashion show every day' (female, 33 years old, teaching history at a secular public high school).

After citing the above interviews, the novice teacher concluded in his document:

'School uniforms are obligatory only in elementary and junior high schools and are merely recommended in high schools. However, problems of school discipline, equality, and security mostly happen in high schools, and hence school uniforms should be obligatory also in high schools'.

### ***Student achievements***

The study findings indicated that many questions touched upon the dimension of '*student achievements*'. For example, regarding the question, '*Why do schools perceive mathematics as one of the most important subjects in school?*' the novice teacher who raised this question argued in his document that:

'... In our time, mathematics is considered to be one of the most important subjects in school, even though in many professions, there is only a need for rudimentary mathematical knowledge' (male, 27 years old, teaching Bible studies at a religious public high school).

In order to gather ideas for an answer to the above question, the novice teacher cited part of the interview he conducted with a high school principal:

Principal (male, 42 years old, working at a secular public high school): 'We don't cancel maths lessons for social activities. The maths teachers demand it. There is a lot of material and unlike literature or Bible lessons, the students can't learn maths by themselves. Also, the parents insist. They think that maths is valuable. Without maths you can't get a matriculation certificate. It is also a cultural issue. You need maths in the practical world. As a principal, I do not have a say on this subject'.

Drawing on this interview, the novice teacher concluded:

'...The principal thinks that maths is important because of national tests and international assessments, such as TIMMS and PISA. According to the principal, maths demands a higher investment in time and practice, while other fields such as literature and Bible studies can be learned alone. In sum, it seems that maths is considered and perceived as more important than other subjects in schools among principals, maths teachers, students, and their parents'.

### ***Student well-being***

The question '*Why are psycho-didactic evaluations not given to each student who enters high school?*' broached the '*student well-being*' dimension, based on the following context described by one of the novice teachers in her document:

'The existing situation in the Israeli educational system is that students in high schools are encouraged to undergo psycho-didactical evaluation only when they are low achievers in relation to the class. Psycho-didactic evaluations cost a lot of money and are usually paid for by the parents. Meanwhile, the student has a negative experience in school. Usually, the evaluations are recommended only for noisy students, while there are many quiet students who may need psycho-didactic them as well' (female, 25 years old, teaching science at a public nonreligious high school).

In relation to this analysis, the novice teacher cited an excerpt from an interview that she conducted with a high school counselor:

Counselor: 'We encourage students to be evaluated if their teachers recommend it. I do not think we should evaluate every student. Currently, there is a deluge in the number of students who have been diagnosed with learning disabilities. Some of the students have difficulties due to current and past laziness, and only pretend to have learning disabilities. We also do not have the money for evaluating the students en masse. This year we only received three scholarships for evaluations. In addition, it takes a long time just to apply for this evaluation...' (female, 30 years old, working in a religious public high school).

Based on this interview, the novice teacher concluded:

'There is a gap between the desirable and the available. The process of evaluating a student is cumbersome. It takes time to fill out request forms and also costs quite a lot of money. Only a few students from low socioeconomic backgrounds get evaluated at the public's expense. Since schools do not have the money and the time to devote to this process, evaluating all students is not feasible'.

### ***Relationship with parents***

The following question, raised by one of the novice teachers, '*What is more widespread in the Israeli school system, parental involvement or parent intervention?*' broached the '*relationship with parents*' dimension. The novice teacher noted:

'Several changes have recently appeared in Israeli society: First, the parents' education level has risen, and is sometimes higher than the teachers', so they are more aware of the importance of education. Second, the parents want a greater say in what their children study. The Ministry of Education's budget is limited, so that even in public schools, parents sponsor enrichment programs. Finally, in comparison with former generations, the relationship between parents and children has become more open, and consequently parents are more aware of what is happening at schools' (male, 28 years old, teaching math at a public religious junior high school).

In relation to this argument, the novice teacher cited part of an interview which he conducted with a junior high school teacher and which influenced his argument above:

Teacher: 'I think that since our students come from higher socio-economic levels, the parents allow themselves to intervene. For example, I wrote a comment in a student's private file about a discipline problem. The parents, who are more educated than me, asked me to remove the comment. Since I did not agree, they appealed to the principal and the principal removed my comment, telling me that there are additional factors to consider . . .' (female, 36 years old, teaching literature at a secular public junior high school).

At the end of the document the novice teacher concluded:

'The reforms allowing parents to send their children to a school of their choice have caused competition among schools for recruiting students. Consequently, school administrators are more flexible, and permit parents to move from involvement to intervention'.

It is important to note that this study focused on novice teachers' perceptions as evinced through the naturalist approach. We cite here the answers given by the documents only in order to shed light on the naturalist learning process through which the novice teachers participating in the study reached their conclusions. The following model emerged from our findings (Figure 1). The learning aspects that novice teachers considered important and interesting were: 'student discipline', 'student achievements', 'student well-being' and 'relationship with parents'. Certainly, the four dimensions are interrelated, and some of the questions which the novice teachers raised were relevant

to more than one of them. In order, however, to assess the important issues which they raised, we found it most helpful to distribute each question into its most salient dimension.

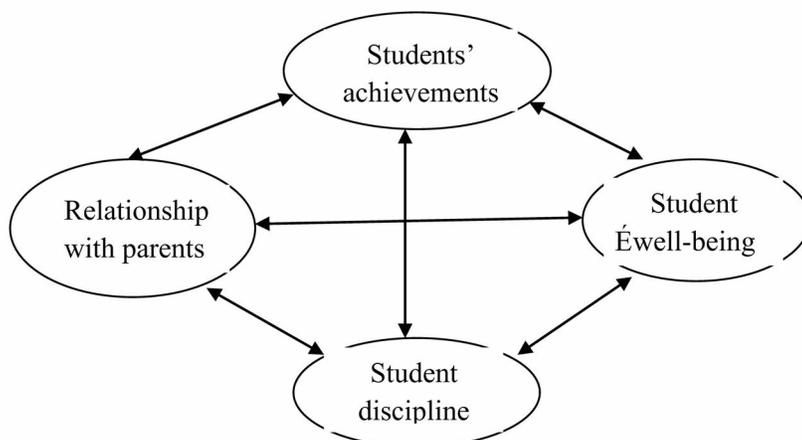


Figure 1. The Learner-Centered Education (LCE) Model Using the Naturalist Approach

## Discussion

This study focused on novice teachers' perceptions based on recent literature indicating that novice teachers' sensitivity to educational processes naturally leads them to ask questions. These questions may help us to improve and update B.A. teachers' training programs. The naturalist approach allowed us to derive four central learning dimensions from the novice teachers' documents: 'student discipline', 'student well-being' and 'relationship with parents'. These dimensions included topics that were not taught or were taught only implicitly in the B.A. teacher training program.

It was also found that although the B.A. program's goal is to give the students a taste of different educational fields of research, it missed a variety of topics which novice teachers perceived to be interesting and relevant, such as student achievements in international assessments, the role of school uniforms, and psycho-didactic evaluations. The findings indicated that the novice teachers also suggested policy changes and other helpful ideas to improve the educational systems in Israel (e.g., school uniforms in high schools). In addition, during the study, the novice teachers developed their critical thinking skills, by asking questions and analyzing the answers received.

According to the theory of LCE, these findings indicate that in order to have meaningful learning, we should also consider the novice teach-

ers' field interests in creating the curriculum for the B.A. program. Furthermore, it seems that besides the naturalist approach's great potential for helping learn basic educational principles, it can also help discover new topics that should be taught. This study may provide an excellent basis for discovering which subjects are most important to teach students, based on what novice teachers consider to be the most interesting educational issues. This approach could make the learning more meaningful, so that the knowledge acquired will be internalized better and not forgotten. Based on previous studies indicating that the perceptions and attitudes of first-year novice teachers are similar to those of B.A. students (e.g., Borko & Putnam, 1996; Friedman & Kass, 2002; Knobloch & Whittington, 2002), the study's underlying intuition is that the novice teachers' perceptions can help us think about how to improve B.A. programs.

Another factor that needs to be taken into account in assessing why 'student discipline', 'student achievements', 'student well-being' and 'relationship with parents' were the main dimensions that interested the participants is the role played by the features that distinguish the Israeli school systems from others around the world. Israeli culture has been depicted by sociologists as uncondusive to *discipline* (Shavit & Blank, 2012). Of 52 nationalities surveyed in a comparative study (Hofstede, 1994), Israelis were found to hold the lowest regard for authority. Other contemporary studies also indicate how *discipline problems* correlate significantly and negatively with *student achievements* in Israeli schools. For example, the 2002 PISA test showed that Israel had the worst record of student absenteeism among 42 participating countries, and that also on measures of student discipline, Israel scored well below the international average (Kramarski & Mevarech, 2004).

In 2003 and 2007, Israeli students have performed significantly worse on international learning assessments (PISA, TIMMS) than students from other countries (Shavit & Blank, 2012). Therefore, the present Israeli educational system emphasis on '*student well-being*' through, for example, reserving multiple individual teaching hours for students with difficulty learning in core subjects such as math, science and Hebrew, a factor which may enhance *student achievements*.

The problem concerning *relationships with parents* can also be traced to the Israeli educational context. Studies drawing on demographic data have shown that Israeli society is more family-oriented than Western and Eastern Europe societies (Feldman, Shafiq, & Nadam, 2001). Several explanations have been given for this, citing, among else, the close-knit character of Israeli society, which tends to strengthen individuals' attachment to their families (Halpern, 2001).

Other research has identified two main forces pulling the Israeli family in opposite directions – the one toward greater modernization, while the other buttressing traditional values – creating, as a result, a vast diversity in family patterns (Lavee & Katz, 2003). This may, then, constitute a significant factor affecting the kinds of tensions that teachers reported in facing their students' families regarding discipline problems, where parents support their child's behavior even against the teachers' educational agenda.

In sum, the study findings, which showed interrelationships between the concepts of 'student discipline', 'student achievements', 'student well-being' and 'relationship with parents', can be traced to the specific challenges facing the Israeli educational system more than those of other countries.

### **Conclusions and practical implications for course designers**

Contemporary society is very competitive. Its competitiveness extends also to student enrollment in universities. There are many appealing courses in the university curriculum, and even more tempting diversions outside the classroom. Students have more freedom to select a B.A. program that meets their needs. It follows that instructors must not only be especially circumspect in their choice of learning materials, but also more persuasive in presenting their discipline to prospective students. Instructors must persuade students that they offer something of value.

A well-conceived and well-executed educational course could teach students more about society and human behavior than any other course at the university. The study's analysis of the perceptions of novice teachers suggests that the naturalist approach is not just an effective device for helping students master basic educational principles, but also an extremely effective vehicle for testing whether the students have, in fact, acquired an in-depth understanding of those principles. In sum, it seems that B.A. program in education should move to a learning-centered educational attitude in which relevant teaching topics are taught by the naturalist approach, which may promote meaningful learning among undergraduate students.

### **Limitations and directions for future study**

Two main limitations of this study deserve mention. First, the sample of novice teachers participating in the study was relatively small (although it may be considered reasonable in a qualitative study). Second, the study was conducted among novice teachers at a single university. Thus, it is hard to prove that the study's findings apply equally to novice teachers at other universities in Israel and abroad.

Due to these limitations, further research is required to demonstrate the effectiveness of the naturalist approach, beyond the findings presented here. For instance, using the naturalist approach on a larger sample might reveal additional LCE dimensions that were not discovered by the present study. Furthermore, longitudinal research, such as examining the reports compiled by students as well as their professors, could be used to study how the naturalist approach affects students' learning. The cross-cultural validity of the current findings in other countries and contexts would also be a worthwhile topic of research.

Finally, another avenue for further research would be to use the naturalist approach and LCE to collect data regarding students' expectations of the learning process. Of utmost importance to this developmental process would be to deal with theoretical questions about the nature of LCE, pinpointing educational principles that can be employed to design and evaluate the learning process.

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