

UNIVERSITY MUSIC EDUCATORS CREATING PIANO-LEARNING ENVIRONMENTS IN FINNISH PRIMARY SCHOOL TEACHER EDUCATION

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Abstract

The importance of supportive learning environments has been considered of utmost importance. In Finnish universities where the educational entities are being re-organised, teacher educators have to reconsider and also reorganise the learning environments to sustain the quality of teaching. At the Universities of Helsinki and Lapland, where the primary school student teachers' music programmes are under serious pressure, a large scale research project "Arctic Reformative and Exploratory Teaching Profession" (ArkTop), was launched, aiming to support teachers' life-long professional development by organizing research based in-service courses, thus, providing possibilities for cooperation and creating networks between universities and comprehensive schools in Lapland through shared expertise, critical reflections and research. Part of this project focuses on different possibilities for developing music, including piano courses in primary school teacher education. In this particular study, the issues of piano-learning environments are examined. The study focuses on mapping the main problems and finding possible solutions in music programmes for creating supportive piano-learning environments in primary school teacher education by analysing topic-specific curricular documents of both universities and the interview data drawn from a number of lecturers. In order to create the best possible learning environments, it is essential to explore how university music educators comprehend the opportunities for designing piano-learning environments.

Keywords: Learning environments, piano learning, primary school teacher education

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1. Introduction

For successful and meaningful learning, supportive learning environments are considered to be of utmost importance. The majority of our learning environments were designed in the last century. Rapid developments in the 21st century have affected the realm of education in search for new approaches when organising and implementing effective models for teaching and learning in different educational institutions. In modern knowledge-based economies, where the demand for high-level skills is growing substantially, many countries also face the challenge of transforming traditional models of teacher education in order to follow the new trends (OECD, 2009).

The term 'learning environment' does not have a clear definition – learning always takes place in a certain place and in a certain way. Scientific literature does not specify an unambiguous definition as to what a learning environment is. For supportive and effective teaching and learning, the meaning of learning environments has been studied by several researchers who have analysed and structured learning environments in different ways (Harris, Marx, & Blumenfeld, 2008; Thornburg, 2014; Kinshuk & Huang, 2015; Fisher, 2016).

Scholars often use it as a general term to discuss unspecified issues connected with places and activities related to the discussion of educational matters (Abualrub, Karseth, & Stensaker, 2013; Grabinger & Dunlap, 1995).

According to Salomon (2006), every environment where learning takes place, can be referred to as a "learning environment". Yet, usually it means the environments, specially designed for studying, where learning takes place as a planned process instructed by teachers, using new technologies, printed materials, and so on.

Entwistle (2007, 2018) has researched the issues of student learning by describing the whole range of different influences, also within university context. He pointed out various aspects of learning environments that shape students' ways of studying, including curriculum structure, course organisation, and the assessment system, as well as classroom size and layout. In combination, these influence the quality of student learning. "A teaching-learning environment includes all the components experienced by students which are intended to help them to learn more effectively – considering various teaching activities, learning materials made available, the support provided by tutors or demonstrators, as well as the assignments students are required to complete and the assessment procedures adopted. The extent to which these components work in consort has an important effect on student learning, as do the perceptions students have of the environment acting as an interactive whole" (Entwistle, 2007, p.8).

Harris, Marx, and Blumenfeld (2008) have listed the following main characteristics of learning environments: aims, tasks, instruction materials, social organization, teachers, technologies, and evaluation. When analysing a learning process, these characteristics can generally be found, yet occasionally some of them may be missing while the significance of others may vary.

Finnish educators and researchers (Manninen & Ylilehto, 2007, pp. 36-41) have structured learning environments as follows:

1.1 physical environment - safe, aesthetic and suitable rooms and premises, necessary for planned learning activities and interaction, meeting various characteristics such as suitable temperature, air and light quality, design, construction materials and so on.

1.2 technological environment - different info-communication technologies and digital learning environments have the increasing meaning and influence in contemporary learning surroundings as well as in everyday lives of the present-day students.

1.3 social environment - communication in the learning process between teachers as competent professionals and intellectuals as well as communication between students in doing group projects.

1.4 didactical environments - the very foundation for planning and designing different aspects of learning for the acquisition of the learning objectives specified in the curricula. The main idea is to select the best possible content and decide on suitable learning activities and methods for its acquisition. This also reflects the value orientation of the teachers and educational institution in particular.

1.5 local environment - the possibilities that depend on different local qualities like museums, libraries, parks as well as landscapes for organising field trips, outings, practices and so on.

According to Goh and Khine (2002), the term “learning environment” has many meanings and it may vary, depending on certain educational cultures and also subjects. One way to support and assist students is to create and offer effective and supportive learning environments using and combining the traditional approaches with the new ideas and technological possibilities. Although the issues of learning environments have been widely researched, the topics concerning music and especially piano-learning environments, have not been studied in depth.

2. Problem Statement

Finnish universities are currently reorganising their educational entities due to declining resources: changing curricula, cutting staff and reducing contact hours. At the Universities of Helsinki and Lapland, the primary school student teachers' music programmes are under serious pressure, creating a challenging situation for both teachers and students. However, it is still necessary to sustain the quality of teaching (Enbuska et al., 2018).

In this field, the Universities of Lapland and Helsinki have been engaging in a lot of cooperation in sharing expertise and carrying out several studies to improve and develop music courses in primary school teacher education (Hietanen & Ruismäki, 2017; Tuisku & Ruokonen, 2017; Ruokonen et al., 2017; Enbuska et al., 2018).

Considering research on music learning environments, it has to be admitted that these issues have been researched only by a few scholars, mainly in connection with music teaching in comprehensive schools, music subject teacher education and latest developments in blended learning (Király, 2012; Bauer, 2014; Kaschub & Smith, 2014; Juntunen, 2014; Läänemets & Rostovtseva, 2015; Ferm-Thorgersen et al., 2016; Ruokonen & Ruismäki, 2016). Music programmes in primary teacher education (in some cases also referred to as class teacher education), especially concerning piano-learning environments definitely require more research (Anttila, 2008; Rauhala, 2015).

This study is part of a large scale research project “Arctic Reformative and Exploratory Teaching Profession” (ArkTop), aiming to support teachers’ life-long professional development by organizing research based in-service courses, thus providing possibilities for cooperation and creating networks between universities and comprehensive schools in Lapland through shared expertise, critical reflections and research.

Part of this project focuses on different possibilities for developing music, including piano courses in primary school teacher education (Sepp et al., 2018). In this particular study, the issues of piano-learning environments have been examined.

3. Purpose of the study

The purpose of this study is to map the main problems and find possible solutions in music programmes for creating supportive piano-learning environments in primary school teacher education. In order to create the best possible learning environments, it is essential to explore how university teachers comprehend the opportunities for designing piano-learning environments.

4. Research Questions

Based on the literature review and purpose of the study, the following research questions were posed:

(1) How do university music educators comprehend piano teaching practices in the University of Helsinki and University of Lapland?

(2) What are the main possibilities and limitations in creating supportive piano-learning environments in Finnish primary school teacher education?

5. Study design and research methods

Based on the ideas of learning environments, the design of the empirical research for this study drew on qualitative approach. The study was conducted in two phases. The first phase included reading and analysing the written curricula of primary school teacher music education (2017 - 2018) of the University of Helsinki and the University of Lapland. The second phase was carried out in spring 2018, when university music educators (n = 5, A – D) from the University of Lapland and the University of Helsinki were interviewed. The questions for the semi-structured interviews were compiled by using the data from the curricula, considering also theoretical background literature and included the same themes. The interviews were carried out in two groups: one group was interviewed in Helsinki (n = 3) and the other in Rovaniemi, Lapland (n = 2).

The interviews were recorded and the audio recordings were listened to a number of times before the transcriptions were written down into text document.

Based on the theoretical background and the research questions, the data were analysed by using qualitative content analysis in six main categories: (1) the objectives of the course; (2) organisation of the studies; (3) the content of the course; (4) the physical and technical environments; (5) the social environment; and (6) the assessment.

6. Findings

In both universities, the main *objectives of the piano course (1)* are to equip the primary school teachers with the essential knowledge and skills, needed for teaching and music making in the elementary level in primary schools.

There is much more in it than just piano playing or accompaniment..... the main idea is to study and practice music and piano is being just one element of the whole study (D).

As most of the students are real beginners, it is important for them to learn the elementary things about music like pitch, rhythm, triads... (D).

The aim is not just to teach piano playing for its own sake, but to provide the primary school teachers with the skills to teach and help their pupils finding the correct melody when singing.

Melody is the starting point - the basis for everything. The child has the right to learn the rhythm and melody correctly. The teacher must be able to perform it, no matter what. and to make sure that children can sing along, so that the range of the melody is suitable for them. After you have taught the melody and children can sing it, you may just accompany the singing (B).

Another significant aim is to teach the students to analyse, listen to, and reflect upon their own piano playing.

One of our goals is to take them to the point where they want to understand, what was the accompaniment about, what they were doing and playing at the moment, and help them to proceed... (B).

University music educators have to consider shaping the values and attitudes of the future primary school teachers towards music in general as most of them have no background or experience whatsoever regarding active music making.

I consider my main task to create some kind of positive attitude towards music in general.... I really take it as an accomplishment to pass the love towards music through my own positive attitude....(A).

The findings considering *organisation of the studies (2)* are influenced by the curricula of the universities. In both universities, there are compulsory music courses for all the primary school music teachers.

In the University of Helsinki, the music course is named Music didactics (all in all 30 contact hours, including 10 contact hours of piano accompaniment). The courses, including the piano, are taught in groups by one teacher at a time. During 2017-2018, the number of students in the whole course was 140, while the piano group consisted of 5 – 6 students whose skills varied quite a lot.

..it is really a challenge to organise the groups and find suitable time for the group lessons.....so it is not their skills in piano, but very often the time that determines the participants of the group (C).

In addition, after attending the compulsory course during the first year, students may choose a supplementary music course (including 20 contact hours of piano accompaniment). In this course, the whole group (usually about 15 – 20 students) works at the same time, so it is a real challenge for the teacher to organise the teaching in a way that everybody can learn something.

The size of the group is a real challenge for the teacher: it needs really much effort to organise the teaching so that everybody gets something... I consider my main task to create a positive attitude towards music in general...I really take it as an accomplishment to pass the love towards music through my own positive attitude ...(A).

In the University of Lapland, the compulsory music course is organised slightly differently. The basic compulsory music course consists of three parts: the Starting path, the Middle path and the Upper path. During the Starting and Middle paths, there are 20 hours of music taught by 2 teachers for a group of 20 students (all in all there are about 100 students divided into 5 groups), usually at the same time:

The whole group is in music premises during the music lessons, it is divided into two and there are two teachers working at the same time in different music classes (D).

After accomplishing the compulsory "paths", it is also possible to choose an additional music course with 3-4 academic hours of group piano lessons (piano playing together with band instruments) and 3 hours (6x30 minutes) of private piano tuition. In the last academic year (2017-2018) 15 students chose this course.

Music educators from both universities highlighted the insufficient number of lessons planned for music studies in primary school teacher music education, including piano playing, especially in view of the really poor knowledge and skills of the basic elements of music.

Roughly, 70% of the students start from the very beginning, from the ABC of music literacy. I have been here over 30 years and the same situation repeats every year. I cannot understand... I do not know the reason for that. We are learning the same things as in primary school grades 1 and 2.....Our students come from all over Finland and it does not matter, if they are from bigger towns or from the countryside, from small or big schools...The most essential thing is the TEACHER – what and how the music teacher has done the job...(E)

The *content of the course* (3) in both universities is greatest influenced by the repertoire used in primary school music education. At the same time, music educators influence the choices, and choose the songs, where certain musical elements can be observed and learned.

As most of the students are real beginners, it is important for them to learn the elementary things about music, like pitch, rhythm, triads... to read the really simple music (D).

...it is more or less my choice ...the repertoire... I have chosen the pieces keeping in mind that they differ to a certain extent and yet, they can be accompanied by using different patterns (E).

The category of *physical and technical environments* (4) is partly connected with the content of the piano studies, social environment which to some extent, also affects the choice of teaching methods. In both universities, there are special and well-equipped premises for teaching music (Orff-instruments, band instruments, iPads). As for piano lessons, digital pianos, equipped with headphones are freely used, so that, in case of group lessons, every student has his/her own privacy. In addition, the University of Lapland has a class supplied with personal computers, where it is possible to connect keyboards for music studies and record their work. The University of Helsinki has special piano studios, where all the pianos can be connected, so that it is possible to guide the studies and also organise pair or group work. It is also possible to make recordings of the piano pieces.

Well, there is half of the group with me in the music class and the other half in the Mac class¹. And I can give instant feedback on what they have recorded... (D).

The possibility to listen to the recorded songs is very important – it gives the possibility for the student to listen and analyse how and what happened, also with the teacher when needed. As most of the students are just beginners, it is difficult to analyse for one's playing at once (C).

The University of Lapland uses Optima as one of its main e-learning environments in primary school teacher education music courses. Music educators are able to add study materials and follow the progress in students' piano playing, whereas students record their playing and get direct feedback on their accomplishments.

The group work in the music class includes more traditional music making... we use also electric musical instruments ... sometimes iPads... Yet the role of technology emerges more in the Mac class. ... it is also possible to include technology to the acoustic instruments and then we can decide... about how it sounds and suits (D).

¹ The class equipped with Macintosh personal computers, designed, manufactured and sold by Apple.

In the University of Helsinki's piano lessons, the e-learning environment called Rockway, which includes different levels and lessons, is being used.

I strongly presume that the use of technology will be increasing in the future... Yet, when we are talking about a student who does not have enough experience in piano playing, he or she definitely needs a kind of guiding in this jungle that for example Youtube is offering. It is just too confusing for the student (A).

Although e-learning environments offer really various useful possibilities, students, especially the beginners in piano playing still need the presence of music educator to give instant feedback and correct the elementary mistakes (wrong fingering, use of piano pedal and so on).

It is common that students without any background in piano playing, do not... they are not accustomed to use all their fingers. And when using only two out of five... it is really tricky. After explaining and trying and understanding that it helps....that there are more fingers.... the results are really better.... And in this case there has to be the "live" teacher who reacts (C).

During the supplementary music course piano classes, the use of videotaping has been used and proved to be of major help in developing the students' piano playing.

Videotaping has really become an important tool in piano classes... So that first you paly and videotape your playing and afterwards analyse WHAT was the way you accompanied the piece... and then it is possible to develop and correct one's playing...The beginner cannot follow everything what is happening. So analysing the video is really helpful (B).

The *social environment* (5) refers to communication in the learning process between music educators and students as well as communication between students in doing group work. Some aspects have been mentioned already in previous categories.

I know exactly what was their level at the very beginning – I have all recorded in Optima mailbox, so I can control what was there at the very beginning and what has happened..... every single one of them have the materials and I can keep the track of their development ... I listen and write comments and give feedback... positive and inspiring personal feedback is essential. The students are motivated by such positive feedback... Yes, it takes a lot of time but considering the big picture... I would not change anything much....(E).

Although the use of technology is a daily habit for contemporary students, not all the students are eager to use technology in music learning

We had to explain what's the idea and reason for using Mac-computers...Although you may assume that the use of technology is an everyday routine....and they are accustomed to using computers... but not this way.... not like this. But the use of technology is not the aim in itself.... it is just to help the matter... (D).

The *assessment criteria* (6) in both universities emphasise the personal approach, following the development of each student.

I have given them 3 assignments: to play one song with accompaniment, to choose one piece they like, and then there is a bonus assignment....I can follow every step on the way from Optima: what was the starting level and what kind of progress has taken place.... So for us the main criteria is the development.....so it is the process. And they know this is being evaluated...We discuss every single student together and we know exactly their path of success... (E).

It is really important to follow the development of every single student. So it is not only the final "product" of how well they play but also what exactly they have learned and to what extent developed their accompaniment skills (B).

I would emphasize still also the final result a little bit... as it is the result of the process what we hear at the end (A).

We cannot work wonders in such a short time. So it is really important what the students do in between the lessons. As you learn to play only by playing (B).

The importance of recording the pieces for assessment, either by saving just the sound or videotaping the hands of the students while playing was considered important.

We discuss the recorded pieces and they also give possibility for self-assessment. This teaches the students also to improve their listening skills (C).

Considering the urgent need for in-service training for class teachers- making videos of how to accompany children songs is one possibility to solve the problem (A).

Music educators of both universities highlighted the lack of musical knowledge and skills of their student teachers that indicate to serious problems and gaps in comprehensive school music level.

It was also mentioned that most of the students are highly motivated to study music, including piano accompaniment. Yet, the important factor here is the minimal number of contact hours which is crucial in learning a musical instrument.

7. Conclusion

The study revealed university music educators' comprehension and ideas about the limitations and possibilities for creating supportive learning environments for primary school teacher education piano studies.

- i. Music educators of both universities highlighted the high motivation of primary school teacher students in studying music, and piano accompaniment. It was mentioned that the aim is not only to teach certain musical knowledge and skills, but to shape positive attitudes towards music in general.
- ii. The main challenges that emerged were the extremely limited number of hours allotted for music studies and the poor level of general musical skills and knowledge of students when starting the course.
- iii. Ideas of blended learning, especially judicious and relevant use of technology, offer solutions to overcome these problems, which includes considering possibilities for organising in-service training for primary school teachers in the field.
- iv. The main task for university music educators' is creating opportunities to acquire piano playing skills in supportive learning environments and through learning strategies that are personalized and adapted to the learner's own learning styles and preferences within the limits of educational institutions.
- v. The majority of our learning environments were created in the 20th century. Now, in the 21st century, learning environments have to be re-designed to meet the multiple needs of modern learners and new emerging technologies.

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References

- Abualrub, I., Karseth, B., & Stensaker, B. (2013). The various understandings of learning environment in higher education and its quality implications. *Quality in Higher Education, 19*(1), 90–110. <https://doi.org/10.1080/13538322.2013.772464>
- Anttila, M. (2008). Luokanopettajaopiskelijoiden musiikin ja musiikkikasvatuksen opiskelumotivaatio. In A. Juvonen, & M. Anttila (Eds.), *Kohti kolmannen vuosituhatvuotisen musiikkikasvatusta. Osa 4: Luokanopettajaopiskelijat ja musiikki. Kasvatustieteiden tiedekunnan selosteita, 4*. 2008. Joensuun yliopisto.
- Bauer, W. I. (2014). *Music learning today: Digital pedagogy for creating, performing, and responding to music*. New York, NY: Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199890590.001.0001>
- Brotheus, A., Hytönen, J., & Krokfors, L. (2001). *Esi- ja algõpetuse didaktika (Didactics of pre-school and primary school didactics, in Estonian)*. Tallinn: TPÜ Kirjastus.
- Enbuska, J., Rimppi, A., Hietanen, L., Tuisku, V., Ruokonen, I., & Ruismäki, H. (2018). E-learning Environments, Opportunities and Challenges in Teaching and Learning to Play the Piano in Student Teacher Education. *The European Journal of Social & Behavioural Sciences, 21*(3), 2562-2569. <https://doi.org/10.15405/ejsbs.226>
- Entwistle, N. (2007). *Research into student learning and university teaching*. Retrieved from https://www.researchgate.net/publication/233637014_1_Research_into_student_learning_and_university_teaching [accessed Jul 23 2018].
- Entwistle, N. (2018). Effects of Teaching-Learning Environments on Student Learning. In: *Student Learning and Academic Understanding: A Research Perspective with Implications for Teaching* (pp. 199–233). Academic Press. <https://doi.org/10.1016/B978-0-12-805359-1.00011-5>
- Ferm-Thorgersen, C., Johansen, G., & Juntunen, M. (2016). Music teacher educators' visions of music teacher preparation in Finland, Norway and Sweden. *International Journal of Music Education, 34*(1), 49-63. <https://doi.org/10.1177/0255761415584300>
- Fisher, K. (2016). *The Translational Design of Schools: An Evidence-Based Approach to Aligning Pedagogy and Learning Environments*. Rotterdam, The Netherlands: Sense Publishers. <https://doi.org/10.1007/978-94-6300-364-3>
- Goh, S. C., & Khine, M. S. (2002). Studies in educational learning environments: An international perspective. Singapore: World Scientific. <https://doi.org/10.1142/5014>
- Grabinger, R. S., & Dunlap, J. C. (1995). Rich environments for active learning: A definition. *Research in Learning Technology, 3*(2), 5–34. <https://doi.org/10.3402/rlt.v3i2.9606>
- Harris, C. J., Marx, R. W., & Blumenfeld, P. C. (2008). Designing learning environments. In T. L. Good (Ed.), *21st century education: A reference handbook* (vol. 1, pp. 225-234). Thousand Oaks, CA: SAGE Publications. <https://doi.org/10.4135/9781412964012.n24>
- Hietanen, L., & Ruismäki, H. (2017). The Use of a Blended Learning Environment by Primary School Student Teachers to Study Music Theory. *The European Journal of Social & Behavioural Sciences, 19*(2), 2393-2404. <https://doi.org/10.15405/ejsbs.212>
- Juntunen, M. (2014). Teacher educators' visions of pedagogical training within instrumental higher music education. A case in Finland. *British Journal of Music Education, 31*(2), 157-177. <https://doi.org/10.1017/S0265051714000102>

- Kaschub, M., & Smith, J. (2014). *Promising practices in 21st century music teacher education*. New York, NY: Oxford University Press.
<https://doi.org/10.1093/acprof:oso/9780199384747.001.0001>
- Kinshuk, T., & Huang, R. (2015). *Ubiquitous learning environments and technologies*. Heidelberg: Springer. <https://doi.org/10.1007/978-3-662-44659-1>
- Király, S. (2012). *Computer-aided ear-training: A contemporary approach to Kodály's music educational philosophy*. Helsinki [i.e. Lohja]: [Susanna Király].
- Läänemets, U. & Rostovtseva, M. (2015). Developing Supportive Learning Environments. *Psychology Research*, 5(1), 32-41. <https://doi.org/10.17265/2159-5542/2015.01.004>
- Lonka, K., & Ketonen, E. (2012). How to make a lecture course an engaging learning experience? *Studies for the Learning Society*, 2-3, 63-74.
<https://doi.org/10.2478/v10240-012-0006-1>
- Manninen, J., & Ylilehto, H. (2007). *Oppimista tukevat ympäristöt: Johdatus oppimisympäristöajatteluun*. Helsinki: Opetushallitus.
- OECD report. (2009). *Creating Effective Teaching and Learning Environments: First Results from TALIS*. Retrieved from <http://www.oecd.org/education/school/43023606.pdf>
- Rauhala, R. (2015). Students' experiences of studying music in small groups. *Procedia - Social and Behavioral Sciences* 171, 695 – 702. <https://doi.org/10.1016/j.sbspro.2015.01.179>
- Ruismäki, H., & Tereska, T. (2006). Early childhood musical experiences: contributing to pre-service elementary teachers' self-concept in music and success in music education (during student age). *European Early Childhood Education Research Journal*, 14(1), 113-130.
- Ruokonen, I., & Ruismäki, H. (2016). E-Learning in Music: A Case Study of Learning Group Composing in a Blended Learning Environment. *Procedia - Social and Behavioral Sciences*, 217(C), 109-115. <https://doi.org/10.1016/j.sbspro.2016.02.039>
- Ruokonen, I., Enbuska, J., Hietanen, L., Tuisku, V., Rimppi, A., & Ruismäki, H. (2017). Finnish student teachers' self-assessments of music study in a blended learning environment. *The Finnish Journal of Music Education*, 20(2), 30-39.
- Salomon, G. (2006). The systematic vs. analytic study of complex learning environments. In J. Elen, & R. E. Clark (Eds.), *Handling complexity in learning environments: Theory and research* (pp. 225-264). Emerald Group Publishing Limited.
- Sepp, A., Hietanen, L., Enbuska, J., Tuisku, V., Ruokonen, I., & Ruismäki, H. (2018). Students' expectations about piano courses in Finnish primary school teacher education. *Society. Integration. Education: Proceedings of the International Scientific Conference*, 1, 501-512. <https://doi.org/10.17770/sie2018vol1.3212>
- Thornburg, D. (2014). *From the campfire to the holodeck: Creating engaging and powerful 21st century learning environments (First edition.)*. San Francisco: Jossey-Bass.
- Tuisku, V., & Ruokonen, I. (2017). Toward a Blended Learning Model of Teaching Guitar as Part of Primary Teacher Training Curriculum. *The European Journal of Social and Behavioural Sciences*, 20(3), 2520-2537. <https://doi.org/10.15405/ejsbs.222>