Rethinking the globalisation of problem-based learning: how culture challenges self-directed learning

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CONTEXT Medical schools worldwide are increasingly switching to student-centred methods such as problem-based learning (PBL) to foster lifelong self-directed learning (SDL). The cross-cultural applicability of these methods has been questioned because of their Western origins and because education contexts and learning approaches differ across cultures.

OBJECTIVES This study evaluated PBL's cross-cultural applicability by investigating how it is applied in three medical schools in regions with different cultures in, respectively, East Asia, the Middle East and Western Europe. Specifically, it investigated how students' cultural backgrounds impact on SDL in PBL and how this impact affects students.

METHODS A qualitative, cross-cultural, comparative case study was conducted in three medical schools. Data were collected through 88 semi-structured, in-depth interviews with Year 1 and 3 students, tutors and key persons involved in PBL, 32 observations of Year 1 and 3 PBL tutorials, document analysis, and contextual information. The data were thematically analysed using the template analysis method. Comparisons were made among the three medical schools and between Year 1 and 3 students across and within the schools.

RESULTS The cultural factors of *uncertainty* and *tradition* posed a challenge to Middle Eastern students' SDL. *Hierarchy* posed a challenge to Asian students and *achievement* impacted on both sets of non-Western students. These factors were less applicable to European students, although the latter did experience some challenges. Several contextual factors inhibited or enhanced SDL across the cases. As students grew used to PBL, SDL skills increased across the cases, albeit to different degrees.

CONCLUSIONS Although cultural factors can pose a challenge to the application of PBL in non-Western settings, it appears that PBL can be applied in different cultural contexts. However, its globalisation does not postulate uniform processes and outcomes, and culturally sensitive alternatives might be developed.

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INTRODUCTION

It is generally acknowledged that education methods reflect cultural and ideological values.[1–3] Addressing the cross-cultural implications of this notion is increasingly urgent in view of the continuing dissemination of education methods around the globe. The globalisation of student-centred methods, including problem-based learning (PBL), is particularly widespread.[4,5] These methods are advocated, particularly in medical education, for their ability to foster self-directed lifelong learning, which is considered indispensible in light of the rapid growth in medical information and the discrepancies between medical graduates' competencies and communities' needs.[6,7] Counterarguments that the assumption of shared values across cultures may be false seem to be largely ignored.[8] Driven by ideological or other motives, the globalisation movement promotes the standardisation of education methods and practices across cultures, apparently with little regard for cultural differences.[9,10] Research outside medical education has revealed differences between cultures in students' learning and preferences for educational approaches.[11–13] Consequently, the cultural origin of a supposedly 'international' educational approach may compromise its suitability for other cultural contexts.[3]

Rooted in Western culture, student-centred, problem-based methods may not be of a truly international nature[3,14] and their compatibility with non-Western cultures has been questioned.[15] Gwee[5] and Khoo[16] pointed to Asian cultural attitudes that might be difficult to reconcile with the educational principles of PBL, but also noted attitudes that might mitigate this discrepancy. The few empirical studies into the cross-cultural applicability of PBL reported positive views among students and staff,[6,7,17,18] but also noted problems and assumed differences with Western practice.[17–19] Most of these studies were limited to the implementation phase of PBL or shortly thereafter and to single institutions, countries or regions, mainly in Asia. Researchers of the cross-cultural applicability of PBL might cast their nets wider to include more cultures and look beyond the implementation stage of PBL. A sound understanding of the role of cross-cultural differences in medical education calls for 'comparative studies of educational values and practices in different cultures and countries'.[8] In response to this call, we are conducting a cross-cultural research project on PBL, after its implementation, in three medical schools in, respectively, East Asia, the Middle East and Western Europe. Our first study showed that students' communicative behaviour during PBL tutorials is a potential source of cross-cultural problems as a result of a significant impact of hierarchical relations, group relations, concern with loss of face, a focus on achievement and competition, and feelings of uncertainty (J.M. Frambach, E.W. Driessen, P. Beh & C.P.M. van der Vleuten, unpublished manuscript, 2012).

The present study investigates whether and how cultural factors affect one of PBL's main educational principles: self-directed learning (SDL).[20] It has been argued that this principle relies strongly on 'Western ideals of democracy, individualism and egalitarianism'.[21] It is defined here as:

'…the preparedness of a student to engage in learning activities defined by himself rather than by a teacher. ''Preparedness'' must be understood as having both a motivational aspect and involving skilled behaviour. Thus, an accomplished self-directed learner experiences an intrinsic need to acquire knowledge, not dominated by requirements set by his teachers. In addition, he has mastered the appropriate information seeking skills, that is: he knows where and how to find information resources that would fulfil his need.'[22]

Culture is defined as the shared motives, values, beliefs and identities of members of collectives.[13] We also examine other contextual factors that may be of influence, such as the education setting and students' past experiences.[21] We use a socio-cultural approach[23,24] to obtain a comprehensive picture of how cultural, societal and other contextual factors affect students' development as self-directed learners, because a socio-cultural perspective is assumed to encompass the cultural and contextual environment.[1,25] Socio-cultural theorists state that humans are continuously influenced and shaped by their environment as they 'internalise' its norms and characteristics.[26,27] Conversely, humans influence and transform their environment by 'externalising' their inner ideas and values.[27] We expected to gain insight into the cross-cultural applicability of PBL by exploring the following research questions: How do students across different cultural contexts *internalise* the principle of SDL? (How does it shape them?) How do students *externalise* their cultural background to the process of SDL? (How do they shape it?)

METHODS

Setting

A qualitative, comparative case study was conducted in two non-Western and one Western medical school.

Nine medical education experts with ample international experience suggested medical schools that met our criterion of a school in a non-Western setting in which PBL has been a substantial teaching method for over 5 years. A medical school in Hong Kong and a medical school in the Middle East were selected and found willing to participate. As the latter school wished to remain anonymous, we refer to its regional rather than its national location. The Western medical school, in the Netherlands, was selected on pragmatic grounds because three of the authors are affiliated to it and it met the criterion for the use of PBL. Ethics approval was granted by the ethics review boards of the Hong Kong and Middle Eastern medical schools. At the Dutch medical school, formal ethics approval is not required for education research.

Data collection

Data for our research project on the cross-cultural applicability of PBL (J.M. Frambach, F.C.J. Stevens, E.W. Driessen and C.P.M. van der Vleuten, unpublished manuscript, 2012; J.M. Frambach, E.W. Driessen, P. Beh and C.P.M. van der Vleuten, unpublished manuscript, 2012) were collected between November 2009 and April 2010, during 1 month of field work in each setting. Data collection was conducted by individuals outwith the respective schools, comprising the first author for the two non-Western schools and a research assistant for the Western school. Different methods were used to enable triangulation.

Students, tutors and key persons involved in PBL were interviewed in depth about practices, perceptions and difficulties concerning PBL, students' development and adaptation, and the roles of cultural and other contextual factors. The semi-structured interviews lasted 1 hour on average and were audio-recorded and transcribed verbatim. Oral and written informed consent was obtained. The participants received a symbolic gift. Purposive sampling ensured the inclusion of male and female students, students from different PBL groups and from the first and third years of training. Sampling across year groups enabled us to explore differences in how students with short and long exposure to PBL shaped and were shaped by SDL. Announcements were made in the lectures and PBL tutorials, and volunteering students were consequently selected according to the sampling criteria and until data collection reached saturation. Sampling of tutors focused on different disciplinary backgrounds and involvement in teaching in Years 1 and 3. Tutors were mainly recruited during observations of PBL tutorials. Key persons (deans, programme directors, coordinators) were recruited by snowball sampling.

Randomly selected Year 1 and 3 tutorials were observed, during which the researchers took field notes and filled in an observation sheet covering aspects of PBL, cultural behaviours and contextual factors. The researchers were briefly introduced at the start of the tutorials and did not participate in sessions. Documents about the implementation and application of PBL were obtained from the key persons. The researchers kept journals in which they recorded additional contextual information. They also reported personal perspectives to create awareness of potential researcher bias. To enhance the trustworthiness of the data, a member check was conducted by asking a sample of the participants to indicate agreement with and comment on a report of preliminary results. The comments were integrated with the data.

Data analysis

Using the thematic approach of template analysis,[28] a succession of coding templates, consisting of hierarchically structured themes, were applied to the data (Fig. 1). ATLAS.ti Version 6.2 (Scientific Software Development GmbH, Berlin, Germany) was used for the coding. All steps and decisions were documented in an audit trail. The first two coding steps were conducted independently by the first two authors.

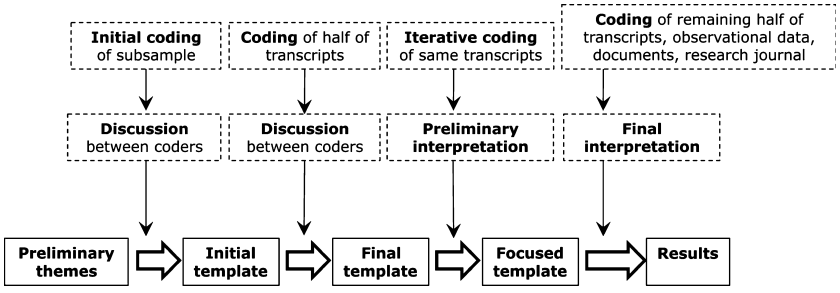

Figure 1 Steps taken in the template analysis process

They developed an initial template after coding a subsample of the interview transcripts using preliminary themes. While analysing half of the transcripts, they developed a final template, which was iteratively applied to the same transcripts. Agreement on the occurrence and interpretation of themes was reached through discussion.

Based on an initial interpretation of the results and on comparisons between the schools and between Year 1 and 3 students across and within the schools, a focused template was developed. While analysing the remaining interview transcripts, field notes and observation sheets, summaries of the collected documents and the research journal with this template, we also looked for disconfirming evidence. A final interpretation led to the creation of a comprehensive picture representing how students' cultural backgrounds and the process of SDL shape one another.

RESULTS

Tables 1 and 2 present the number of interviews and observations in each school, and student demographics. The documents (information booklets for students, course schedules, problem cases, sheets for evaluating students in PBL, internal evaluations of PBL) yielded information about the structure, content and implementation of the curricula. Table 3 shows PBL characteristics in the schools. The Dutch and Middle Eastern medical schools had applied PBL as the main educational method since their foundation, whereas the Hong Kong medical school had a

Table 1 Number of interviews and observations at the three medical schools

	Middle Eastern medical school	Hong Kong medical school	Dutch medical school	Total
Interviews, *n*				
Year 1 students	9	10	9	28
Year 3 students	10	9	9	28
Tutors	6	6	5	17
Key persons	5	5	5	15
Interviews total	30	30	28	88
Observations, *n*				
Year 1	5	6	8	19
Year 3	5	6	2	13
Observations total, *n*	10	12	10	32

Table 2 Demographic information on the student samples

	Middle Eastern medical school	Hong Kong medical school	Dutch medical school
Year 1 students, mean age, years	17.3	18.6*	19.1
Year 3 students, mean age, years	19.0	21.0†	21.3
Gender: female	42.1%	47.4%	88.9%
Ethnicity	97.4% Arab	94.7% Chinese	77.8% Dutch

* Excluded: two unknown; one outlier
† Excluded: one unknown; one outlier

Table 3 Characteristics of problem-based learning (PBL) in Years 1–3 in the three medical schools

	Middle Eastern medical school	Hong Kong medical school	Dutch medical school
Period of applying PBL	> 30 years	> 10 years	> 30 years
Students entering yearly, *n*	200	180	340
Lectures per week, mean	4	7	2
Average PBL group size, *n*	10	10	10
PBL tutorials per week, mean	2	2 (Year 3: 1)	2 (Year 3: 1)

hybrid curriculum with lectures and PBL tutorials. In all schools, tutorials lasted 90–120 minutes and consisted of students' discussion of a problem case and formulation of learning objectives. Between tutorials, students conducted self-study and attended lectures and skills sessions. In Year 3, both the Hong Kong and Dutch medical schools offered more clinical education; however, the Dutch school provided fewer but longer tutorials, and the Hong Kong school provided fewer PBL but more non-PBL tutorials.

The results of the analysis are presented under the headings of the key cultural and contextual factors considered relevant to the cross-cultural applicability of PBL. These factors were valued or applied differently in the three schools, which influenced the cross-cultural process of SDL. The results from the four data sources (interviews, observations, documents, contextual information) are presented in an integrated manner. Table 4 reports an overview of key findings.

Uncertainty and tradition in the Middle East

Middle Eastern students expressed more feelings of uncertainty as a cultural factor compared with Dutch and Hong Kong students. Their uncertainty and difficulties in adapting to SDL were related to sharp contrasts between PBL and their prior educational experiences. Rather than feeling motivated, many students felt lost and unable to find appropriate information to address their learning objectives. Uncertainty was related to experiences of traditional, teacher-centred secondary education, but also to a culturally determined focus on tradition. Middle Eastern respondents referred to their society's respect for the 'old ways' and wariness regarding innovations. As they became used to PBL, however, their attitudes changed significantly. Students came to support the principle of SDL and information seeking became less problematic, although students still felt PBL was not easy and wanted more guidance:

Table 4 Cultural and contextual factors resulting in externalisation and internalisation

Cultural factors	Contextual factors	Externalisation: how students shaped SDL	Internalisation: how SDL shaped students
Uncertainty and tradition	Nature of secondary education: teacher or student-centred	SDL after period of adjustment and with guidance from seniors	Development of motivation for SDL and an understanding of its purpose
Hierarchy	Scope of PBL implementation: hybrid or full	SDL to the extent that knowledge was not covered by lectures or professors	Development of skills for information seeking and knowledge construction
Achievement	Content of assessment: covered in lectures or PBL tutorials	SDL to the extent it contributed to preparing for examinations	

Expressions of these factors, particularly achievement, were found in all three locations, but to varying degrees. Uncertainty and tradition were more apparent in the Middle East, and hierarchy was more apparent in Hong Kong
PBL = problem-based learning; SDL = self-directed learning

'Look, here in this country we do not like change, we always like the old ways. […] So at first I was like, I do not want to change, but when I came here I found this was, as time goes by, I would choose this faculty for my study years at the university.' (ME, Year 3, Student 8)

'I think, now, while we are studying, we find it hard, but it will make us good doctors. They make us think about what we are learning, find more than one book, and talk about the same topic from different points of views.' (ME, Year 1, Student 8)

Having experienced information searching and self-study in secondary school, Dutch students had less difficulty in adapting to SDL. In addition, Dutch culture places less value on tradition. Although the Dutch students were less uncertain, they required time to develop information-seeking skills and they generally preferred tutors who provided clear guidance. A particular problem for them concerned determination of the depth and breadth of the knowledge to be attained. Dutch, Hong Kong and, particularly, Middle Eastern students tried to cope with uncertainty and independence by asking senior students for advice and materials. Although it reduced insecurity, this strategy discouraged them from depending upon themselves for their learning:

'Sometimes it is too free for some students, like, what am I supposed to do now? And then they'll copy things from other students, to have that certainty of, well, ''He passed his exam with that so I will use it too.'' Because at first, you really don't know where to search.' (NL, Year 3, Student 2)

Hybridism and hierarchy in Hong Kong

From the outset, finding information was less difficult for Hong Kong students. As topics of tutorials were also covered in lectures in the hybrid curriculum, identifying learning needs and developing information-seeking skills were less relevant to Hong Kong students. They showed little awareness that PBL was intended to foster SDL. Whereas the lectures covered the basic sciences, the Hong Kong tutorials focused more on clinical reasoning skills. By contrast, the Dutch and Middle Eastern students had to rely on tutorials for most of their knowledge. The Hong Kong students often felt the tutorials repeated the content of lectures, which some appreciated as providing a useful opportunity for revision and a chance to apply their knowledge to a clinical case, but others considered a waste of valuable study time:

'This PBL actually helps me to memorise the facts we have learned, because we have to research the things ourselves first and then we have lectures to confirm our findings and to let us know what to memorise, and then we have to present it again during the next PBL session.' (HK, Year 1, Student 2)

'Frankly, I don't know the purpose of the faculty to give us PBL.' (HK, Year 1, Student 1)

Some Hong Kong students were anxious about multiple interpretations that might come up during tutorial discussions because these created uncertainty about the 'truth' and they were hesitant about trusting their peers' statements. This reflected their experience of a teacher-centred secondary education, as well as the culture of a hierarchical society in which knowledge and authoritative statements about the 'truth' are expected to come from professors or experts who represent persons of higher status. Students were not used to having to rely entirely on themselves for their learning. They also attached greater value to tutorials that were facilitated by expert clinicians rather than by non-experts. Although Dutch students also preferred facilitation by expert tutors, they were comfortable relying on their peers. The impact of hierarchy was also evident in the Middle Eastern school and manifested in students' experiencing of anxiety about the requirement to search independently for the 'truth'. However, by Year 3, student anxiety in the Middle East school had abated, whereas student anxiety in Hong Kong showed little difference between the years:

'I guess the international students like it more. They like the discussion more, even when they don't find the answer. But for local students, even if they are okay with the discussion, they are very focused on finding a way to get the right answer. […] We want to end the case and get all the answers quickly and maybe we are also more obsessed with the official version of everything. Like, we want the official answer.' (HK, Year 3, Student 8)

Achievement and assessment across cultures

Middle Eastern and Hong Kong students characterised themselves and their respective societies as competitive and described themselves as striving for success and to be the best. They felt pressured to pass examinations and rank among the top students:

'I think the common characteristic of local Chinese students is that they care very much about the result.

We also have students from overseas, from Australia or the UK, they always say that Hong Kong students work very hard but also care too much about their results.'(HK, Year 1, Student 7)

Dutch students were also examination-focused, although their responses during interviews suggested a lower level of culture-related focus on achievement and success compared with the other two cohorts. The general feeling among the three groups of students was that they valued PBL only for its contribution to their examination preparation. This depended on examination content. In Hong Kong, examination content was mainly determined by lectures. In the Middle Eastern and Dutch schools, it depended more on PBL tutorials. However, particularly in the Middle Eastern school, the inclusion of additional topics caused students to concentrate on these predetermined additional topics and their lecture notes more than on identifying and addressing their individual learning needs. Even if they supported and understood the principle of SDL, achievement and assessment took priority, directing their attention and efforts away from SDL to examination content:

'They are exam-oriented, their strong concern is for the exams. When we discuss a problem case I say, for example: ''You should know about this thing.'' They answer: ''No, it's not written in the preset objectives.''' (ME, Tutor 1)

'What I want is group discussion. I don't want the group to gather to produce a nice document of the collected information, but I sometimes feel that's the students' goal: ''Then we have a nice summary of different sources to study for the exam.'' Well, that doesn't contribute to the discussion in the group, while I think that's what's important.'(NL, Tutor 1)

DISCUSSION

This study of cross-cultural differences in PBL education practice explored how students in three different cultural contexts internalised the PBL principle of SDL and externalised their cultural background to the PBL process. Students externalised cultural factors that conflicted with cultural values residing in the PBL goal of SDL. Feelings of uncertainty about the independence required in SDL, a focus on tradition that impeded the uptake of a new approach to learning, a dependence on hierarchical sources rather than oneself or one's peers, and pressure to achieve rather than an intrinsic motivation to learn posed challenges to non-Western students in particular. This is consistent with previous reports that similar factors interfered with non-Western students' development of critical discussion behaviours in PBL (Frambach et al, unpublished manuscript, 2012). Uncertainty, tradition, hierarchy and achievement have often been identified as more prominent in non-Western than in Western cultures.[29–31] This suggests a certain incongruity between PBL and non-Western cultures, which complicates the straightforward transfer of PBL to such cultural contexts.

However, cultural factors clearly do not explain all of the discrepancies in findings between the respective contexts. Several contextual factors, such as a traditional, teacher-centred secondary education, a hybrid curriculum and examination content not covered during PBL sessions further complicated students' development of SDL skills. For example, the secondary school education system in Hong Kong is very much based on knowledge acquisition and rote learning to pass examinations. Because teachers and recommended textbooks serve as the main sources of information, there is little opportunity for SDL. Therefore, it is not surprising that current Hong Kong medical students remain dependent on teachers and lectures for their learning. However, this may change in the future in response to education reform taking place in Hong Kong high schools, which emphasises SDL by students as a major educational goal.

Our findings support earlier comments that the development of SDL and other PBL skills depends heavily on the context in which PBL is applied.[21] Research suggests that SDL does not occur automatically when PBL is implemented. Carefully considered and focused efforts are needed to shape a propitious context.[32,33] In fact, exposing Year 1 students to the independent learning environment of PBL without providing them with adequate guidance may, rather than promoting the development of SDL skills, cause them to become severely dependent on tutors, predetermined learning objectives and on rote learning in order to 'survive'.[32,33] This is supported by our findings that students across three different cultures, albeit to different degrees, mentioned similar behaviours, needs and preferences with regard to alleviating uncertainty, consulting senior students, asking for tutor guidance and focusing on examination content.

A possible solution might be to strike a balance between using SDL as a means to PBL and perceiving

it as an end of PBL.[33] Gradual exposure to SDL, with relatively strong guidance and support in the first year, might ultimately yield the development of more SDL skills.[33] Our findings suggest that this is particularly relevant in contexts in which secondary education is teacher-centred, no hybrid approach is followed, and the cultural factors of uncertainty, tradition, hierarchy and achievement are valued highly. Further research might investigate how these factors can be addressed at a practical level to foster SDL in PBL.

Despite the challenges, however, students across the three cultures increasingly internalised the principle of SDL as they moved from Year 1 to Year 3. The Middle Eastern students made substantial progress from initial uncertainty to preparedness to determine their own learning activities and find relevant information. Because of their pre-university experiences in SDL, the progress of the Dutch students was less marked, but still noticeable. Hong Kong students seemed to quickly adapt to the PBL learning environment and to develop clinical reasoning skills, but were less stimulated to develop SDL skills in terms of determining learning objectives and consulting different information sources. These findings would appear to be consistent with those of studies reporting that SDL skills develop naturally as students become used to the PBL process and curriculum.[33,34] Thus, although PBL may not be cross-culturally applicable in a straightforward way, it would be wrong to conclude that it cannot be applied across cultural contexts as practice continues to prove.

This study is limited by its focus on a single medical school in each cultural setting because the cultural diversity of medical schools can be greater within than across regions. Furthermore, the characterisation of Hong Kong culture as non-Western is debatable. However, a large body of research on cross-cultural differences in learning between Eastern and Western contexts is based on findings derived from studies in which Hong Kong is perceived as representing an Eastern context.[18,30,35,36] Further research might focus on potentially more generalisable findings by investigating more medical schools within and across different cultural regions.

Another limitation is that the results reflect the analysis and interpretation of authors with backgrounds in Western culture and in educational and social sciences. Researchers from other backgrounds might have approached the data from a different perspective. We have attempted to reduce the effects of this bias by performing multiple quality checks as described above. In addition, one author with a non-Western background has critically revised and approved the interpretation. Furthermore, we sought to identify resonance with existing literature by Western and non-Western authors for our framework, results and interpretation. Even so, we invite researchers with different cultural and disciplinary backgrounds to engage in similar research to create a comprehensive and culturally sensitive picture of the subject.

This study is strengthened by its addition of empirical data from natural settings to a debate that until now has been driven largely by theory and assumptions.[1,8] Its findings confirm that medical education across cultures shares many issues and frustrations,[37] but they also reveal many differences.[1,8,10] The implication for the globalisation of PBL is that careful consideration must be given to cultural and contextual factors before and during the implementation and application of PBL. Educators and curriculum developers should ask themselves the following key questions: What do we want to achieve and why? Is this achievable and how do we achieve it in our setting?

A more fundamental question is whether PBL should be globalised in the first place. It is true that medical education worldwide is in need of reform, but whether one solution should be applied to all contexts is debatable. Currently, student-centred methods originating in Western culture seem to represent an 'international' standard. Yet, as this study confirms, the cross-cultural applicability of these methods may be questionable. Rather than taking on the cultural and contextual challenge of adopting student-centred, problem-based methods, it might be wiser for medical educationalists to rise to the challenge of exploring or creating alternatives that best fit their particular context. Given the current movement towards the development of 'international standards', this is a major challenge indeed. However, the rising influence of the Asian region and rapid developments in other parts of the world may imply changes in the future landscape of medical education.

Contributors: JMF, EWD and CPMvdV conceived the original idea for this research and designed the study. L-CC made substantial contributions to the acquisition of data. JMF and EWD analysed and interpreted the data. JMF drafted the manuscript, and EWD, L-CC and CPMvdV critically revised it. All authors approved the final manuscript for publication.

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